Studies in Linguistics and Philosophy

Volume 43

Managing Editors

GENNARO CHIERCHIA, *University of Milan*
PAULINE JACOBSON, *Brown University*
FRANCIS J. PELLETIER, *University of Alberta*

Editorial Board

JOHAN VAN BENTHEM, *University of Amsterdam*
GREGORY N. CARLSON, *University of Rochester*
DAVID DOWTY, *Ohio State University, Columbus*
GERALD GAZDAR, *University of Sussex, Brighton*
IRENE HEIM, *M.I.T., Cambridge*
EWAN KLEIN, *University of Edinburgh*
BILL LADUSAW, *University of California at Santa Cruz*
TERRENCE PARSONS, *University of California, Irvine*

The titles published in this series are listed at the end of this volume.

THE PARAMETER OF ASPECT

(SECOND EDITION)

by

CARLOTA S. SMITH
Department of Linguistics,
University of Texas

KLUWER ACADEMIC PUBLISHERS
DORDRECHT / BOSTON / LONDON

.P. Catalogue record for this book is available from the Library of Congress.

0-7923-4657-2 (Hb)

Published by Kluwer Academic Publishers,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

Sold and distributed in the U.S.A. and Canada
by Kluwer Academic Publishers,
101 Philip Drive, Norwell, MA 02061, U.S.A.

In all other countries, sold and distributed
by Kluwer Academic Publishers Group,
P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Printed on acid-free paper

All Rights Reserved
© 1997 Kluwer Academic Publishers
No part of the material protected by this copyright notice may be reproduced or
utilized in any form or by any means, electronic or mechanical,
including photocopying, recording or by any information storage and
retrieval system, without written permission from the copyright owner.

Printed in the Netherlands

TABLE OF CONTENTS

PREFACE xi

INTRODUCTION xiii

PART I xix

CHAPTER 1: THE APPROACH 1

1.1 The general theory 1
1.1.1 The two components in sentences 2
1.1.2 Aspectual systems in language 4
1.2 Aspectual choice 6
1.3 The structure of the aspectual components 8
1.3.1 The logic of markedness 8
1.3.2 Markedness, categorization, and aspectual choice 10
1.3.3 Situation type categories and prototype theory 11
1.4 The parameter of aspect and Universal Grammar 13

CHAPTER 2: SITUATION ASPECT 17

2.1 Basic-level and derived-level situation types 17
2.2 Temporal features of the situation types 19
2.3 The causal chain 21
2.4 The situation types 22
2.4.1 Activities 23
2.4.2 Accomplishments 26
2.4.3 Semelfactives 29
2.4.4 Achievements 30

2.4.5 Statives 32
2.5 The general categories of event and state 35

CHAPTER 3: THE LINGUISTIC REALIZATION OF THE SITUATION TYPES 39

3.1 Syntactic and semantic properties 39
3.1.1 Linguistic properties of the temporal features 39
3.1.2 Linguistic characterization of the situation types 44
3.2 Derived situation types 48
3.2.1 Super-lexical morphemes: lexical focus 48
3.2.2 Multiple-event Activities 50
3.2.3 Habitual Statives 50
3.2.4 Marked focus 51
3.2.5 A principle for interpreted situation type shifts 53
3.3 Rules for composing verb constellations 54
3.3.1 Basic-level verb constellations 54
3.3.1 Derived-level verb constellations 55
3.4 Verb constellations of interest 56
3.4.1 Perception verbs, Personal property predicates 56
3.4.2 Vague verb constellations 58

CHAPTER 4: VIEWPOINT ASPECT 61

4.1 Semantic information and aspectual viewpoints 62
4.2 Families of viewpoints 65
4.2.1 Perfective viewpoints 66
4.2.2 Imperfective viewpoints 73
4.2.3 Neutral viewpoints 77
4.3 The independence of viewpoint and situation type 81
4.3.1 Viewpoint span 81
4.3.2 Visible information and the imperfective paradox 83
4.3.3 The relation between statives and imperfectives 84
4.4 Viewpoints and conventions of use 86
4.4.1 Pragmatic conventions and closed systems 86
4.4.2 Augmented interpretations 87
4.4.3 Conventions of use for aspectual viewpoints 88
4.4.4 Narrative conventions and the viewpoints 92

CHAPTER 5: TEMPORAL LOCATION 97

5.1 Time and temporal location 97
5.2 Temporal information in sentences 99

5.2.1 The coordinates of temporal location 99
5.2.2 Temporal reference and temporal location 101
5.3 Tenses and the perfect 106
5.3.1 Tense 106
5.3.2 The perfect 106
5.3.3 Sentences about the Present 110
5.4 Adverbials 112
5.5 The interpretation of temporal expressions 117

CHAPTER 6: THE FORMAL ANALYSIS OF TEMPORAL MEANING 123

6.1 Formalizing aspectual concepts 123
6.2 Situation aspect 124
6.3 Viewpoint aspect 126
6.3.1 Perfective viewpoints 128
6.3.2 Imperfective viewpoints 130
6.4 From form to meaning: Determining the aspectual meaning of sentences 131
6.4.1 Computing scopal structure 132
6.4.2 Compositional rules for situation type 133
6.5 Determining the temporal location meaning of sentences 137

CHAPTER 7: ASPECTUAL MEANING IN DISCOURSE REPRESENTATION THEORY 141

7.1 Meaning and language understanding 141
7.2 Discourse Representation Theory 144
7.3 Discourse Representation Structures 145
7.3.1 Aspectual meaning in Discourse Representation Structure 145
7.3.2 Temporal location in Discourse Representation Structures 148
7.3.3 Other viewpoints in Discourse Representation Structures 150
7.4 Relating the Discourse Representation Structure to a model 152
7.5 Aspectual indeterminacy and inference 154
7.6 Additional DRSs 160

PART II 165

INTRODUCTION TO PART II 167

CHAPTER 8: THE ASPECTUAL SYSTEM OF ENGLISH 169

8.1 Introductory characterization 169
8.2 Viewpoint aspect 169

8.2.1 The perfective viewpoint 170
8.2.2 The imperfective viewpoint 171
8.2.3 Conventions of use 175
8.3 Situation type 176
8.3.1 Temporal properties in sentences of English 176
8.3.2 Activities 177
8.3.3 Accomplishments 178
8.3.4 Semelfactives 180
8.3.5 Achievements 181
8.3.6 Statives 182
8.4 Temporal location and aspect 184
8.4.1 Present tense sentences 185
8.4.2 The Perfect construction 186
8.4.3 The Futurate 189

CHAPTER 9: THE ASPECTUAL SYSTEM OF FRENCH 193

9.1 Introductory characterization 193
9.2 Viewpoint aspect 193
9.2.1 The perfective viewpoint 194
9.2.2 The imperfective viewpoints 197
9.2.3 The Neutral viewpoint 201
9.3 Temporal location 204
9.3.1 The Past tenses 204
9.3.2 The Present tenses 208
9.3.3 The Future tenses 210
9.3.4 Conventions of use 211
9.4 Situation Aspect 214
9.4.1 Temporal properties in French 214
9.4.2 Activities 215
9.4.3 Accomplishments 218
9.4.4 Semelfactives 220
9.4.5 Achievements 220
9.4.6 Statives 222

CHAPTER 10: THE ASPECTUAL SYSTEM OF RUSSIAN
with Gilbert Rappaport 227

10.1.1 Introductory characterization 227
10.1.2 Morphological preliminaries 228
10.2 Viewpoint aspect 229
10.2.1 The perfective viewpoint 230
10.2.2 The imperfective viewpoint 231
10.2.3 Conventions of use 234
10.3 Situation aspect 241

10.3.1 Grammatical features of Russian 241
10.3.2 Temporal properties in Russian 242
10.3.3 Activities 243
10.3.4 Accomplishments 245
10.3.5 Semelfactives 246
10.3.6 Achievements 247
10.3.7 Statives 248
10.4 Temporal location 250
10.4.1 Tense 250
10.4.2 Adverbials 251
10.4.3 Infinitives 252
10.5 Negation 256
Appendix: Test for the viewpoint aspect of a verb form 258

CHAPTER 11: THE ASPECTUAL SYSTEM OF MANDARIN CHINESE 263

11.1.1 Introductory characterization 263
11.2 Viewpoint aspect 263
11.2.1 The perfective viewpoints 263
11.2.2 The imperfective viewpoints 271
11.2.3 The neutral viewpoint 277
11.2.4 Conventions of use 279
11.3 Situation aspect 281
11.3.1 Grammatical features of Mandarin 281
11.3.2 Temporal properties in Mandarin 284
11.3.3 Activities 285
11.3.4 Accomplishments 287
11.3.5 Semelfactives 290
11.3.6 Achievements 291
11.3.7 Statives 292
11.3.8 Verb constellations of special interest 294

CHAPTER 12: THE ASPECTUAL SYSTEM OF NAVAJO 297

12.1 Introductory characterization 297
12.1.1 The Navajo Aspectual System 297
12 1.2 Preliminaries: The Navajo verb 298
12.2 Viewpoint aspect 300
12.2.1 The perfective viewpoint 301
12.2.2 The imperfective viewpoint 302
12.2.3 The progressive viewpoint 303
12.2.4 The neutral viewpoint 304
12.2.5 Conventions of use 306
12.3 Situation aspect 309

12.3.1 The Navajo sentence 309
12.3.2 Temporal properties in Navajo 312
12.3.3 Durative events 313
12.3.4 Instantaneous events 317
12.3.5 Statives 317
12.4 Lexical and morphological factors 319
12.4.1 Super-lexical morphemes 319
12.4.2 Verb lexeme categories 321
12.5 Time expressions in Navajo 323
12.5.1 Temporal location: tense and adverbials 323
12.5.2 Temporal duration 324
Appendix: Examples of VLC category members 327

REFERENCES 331

GENERAL INDEX 343

NAME INDEX 347

PREFACE

While working on this project I have received institutional support of several kinds, for which I am most grateful. I thank the Institute for Advanced Study at Stanford University, and the Spencer Foundation, for a stimulating environment in which the basic idea of this book was developed. The Max Planck Institute for Psycholinguistics at Nijmegen enabled me to spend several months working on the the manuscript. A National Science Foundation grant to develop Discourse Representation Theory, and a grant from The University Research Institute of the University of Texas, also gave me time to pursue this project.

I thank Helen Aristar-Dry for reading early drafts of the manuscript, Östen Dahl for penetrating remarks on a preliminary version, and my collaborator Gilbert Rappaport for relentless comments and questions throughout. People with whom I have worked on particular languages are mentioned in the relevant chapters. I owe a special debt of gratitude to the members of my graduate seminar on aspect in the spring of 1990: they raised many questions of importance which made a real difference to the final form of the theory. I have benefitted from presenting parts of this material publicly, including colloquia at the University of California at Berkeley, the University of California at San Diego, the University of Pennsylvania, Rice University, the University of Texas, and University of Tel Aviv. I thank Adrienne Diehr and Marjorie Troutner for their efficient and good-humored help throughout the work on the first edition.

The present edition differs in several ways from the first. Part I has been revised to reflect developments in the two-component theory, to sharpen and emphasize points that lagged, and to cut down on repetition. Substantive changes include: discussion of independent and intrinsic boundedness; a better account of situation type shifts and derived situation types; a discussion of dynamism and the global semantic categories of states and events, and the Activity situation type; a more complete treatment of temporal location in DR theory; direct statement of the syntactic and semantic properties of the situation types; an insistence on evidence from syntactic and semantic tests. In Part II, there are some changes in analysis and presentation. The changes include more complete discussion of the Perfect and the Futurate in English;

more sophisticated treatments of the viewpoints of Mandarin, and of the situation types and morphological categories of Navajo. I have added references to new publications that are directly relevant to this work. Unfortunately, I have not been able to include the burgeoning literature on aspect of the past few years. I would note that Binnick 1991 discusses much current work in the formal, grammatical tradition.

I should like to thank my students at the University of Texas, and audiences at the University of Michigan, the University of California at Santa Cruz, the Colloquium on Space, Time, and Reasoning at the University of Toulouse, the University of Trondheim, the Workshop on Tense and Aspect at Cortona, Italy, for their helpful comments and suggestions. I also thank my colleagues Manfred Krifka and Stephen Wechsler for interesting discussions of some of this material. Elizabeth Menon has taken on the indispensable task of converting the manuscript from disc to camera-ready copy, for which I thank her. Finally, I would like to thank my family: my children, Alison Smith and Joel Smith, for being there; and my husband, John Robertson, for his love and encouragement.

INTRODUCTION

1. Aspectual meaning contributes temporal information and point of view to sentences. It is through aspect that we grasp the type of situation talked about, from a temporal perspective which focuses all or part of the situation. Temporality in this sense concerns the way situations unfold in time. It involves such properties as beginnings and endings, dynamic stages and static periods. The domain of aspect has an interesting subjective factor, because a choice between aspectual meanings is often available to the speaker. In this book I will develop a linguistic theory of aspect. The theory constructs precise aspectual meanings, and shows how they are conveyed by linguistic forms and pragmatic conventions.

The aspectual meaning of a sentence conveys information of two kinds: a situation is presented from a particular perspective, or viewpoint; and the situation is indirectly classified as a state or an event of a certain type. To illustrate I give some key examples. The sentences in (1) present the same event. They have different aspectual viewpoints, traditionally known as perfective and imperfective. The viewpoints are conveyed by the form of the verb, (1a) having the perfective and (1b) the imperfective viewpoint. The viewpoints differ in meaning: they present all or part of the event. To see this, consider the aspectual information conveyed by the two sentences:

(1) a. John and Mary built a rock garden last summer.
b. John and Mary were building a rock garden last summer.

From (1a) we know that a building event occurred in its entirety. In contrast, (1b) conveys only that a building event was in progress. There is no information about the beginning or end of the event, so that we do not know whether it was completed. These examples suggest that the perfective viewpoint spans an entire event, while the imperfective spans only part of it. Later in this book I will give evidence which shows that these meaning are indeed conveyed by the forms of aspectual viewpoint.

The second kind of aspectual information is more subtle. It classifies the situation presented in a sentence as belonging to a certain class; I use the term 'situation' as

neutral between event and state. Consider for instance the examples in (2); they present situations of different types, with the same aspectual viewpoint, the perfective (conveyed by the simple form of the verb in English).

(2) a. The bird flew.
b. The bird was in flight.

(2a) presents an activity event, while (2b) presents a state. Each of these situations has a crucial temporal property: activities are dynamic, while states lack dynamism. They belong to different situation types. The term 'situation type' refers to classes of events and states; the nature of these classes is discussed at length in this book

In this book I will explicate the intuitions about viewpoint and situation within a theory of aspectual meaning. Aspect concerns the temporal organization of situations and temporal perspective. The aspectual meaning of a sentence results from interaction between two independent aspectual components, situation type and viewpoint. Both are realized in linguistic categories. I wish to emphasize that aspectual categories have linguistic properties that can be demonstrated, and tested. I will give syntactic and semantic evidence for every step of the analysis.

The two-component theory provides a principled approach to the relation between the situation type (event or state) and viewpoint (perfective or imperfective) of a sentence. There is certainly such a relation, as many scholars have recognized. It is well-known that the co-occurrence patterns of adverbials, for instance, involve such concepts as event and state on the one hand, and aspectual viewpoint on the other. The same is true of the entailment patterns of sentences. The theory that I will present offers a general treatment of the interaction between these different factors. It leads to a consistent and elegant formal account of aspectual meaning. The theory is stated as a procedural, process-oriented treatment of semantic and pragmatic meanings in the framework of Discourse Representation Theory.

The linguistic forms of a given sentence present a situation of a certain type from a certain temporal viewpoint or perspective. It is clear that both types of information are available in a sentence. Viewpoint is generally indicated morphologically, with affixes or other designated morphemes. Situation type is conveyed more abstractly, by the verb and its arguments, or verb constellation. The forms that specify each aspectual component co-exist in a sentence.

Languages differ in the aspectual meanings they express. The basic situation types and viewpoints appear quite generally, with variations from one language to another. Some are straightforward, some quite subtle. The two-component theory is general enough to account for the similarities, and yet has sufficient precision for particular systems and variations. The development of such a theory presents a challenge that is familiar in linguistics. I shall take the parametric approach, in which aspect is treated as a sub-system with its own internal organization, characteristics, and dimensions along which it varies. The theory identifies viewpoint aspect and situation aspect as the basic components of aspectual systems.

Parametric variation occurs across languages in many domains, including the aspectual. Such variation is orderly and to some extent predictable. To account for it,

I propose formal and substantive principles that underlie the domain of aspect in Universal Grammar. The components of situation type and viewpoint appear, by hypothesis, in the grammars of all languages. The substantive principles for both components are based on the temporal structure of states and events. Only a small set of situation types and viewpoints are posited. This decision leads to general, underdetermined categories which vary widely across languages.

2. I assume that the aspectual categories are not language dependent, but are based in human cognitive abilities. People distinguish the basic situation types on the basis of their perceptual and cognitive faculties, just as they distinguish the countable and uncountable entities to which mass and count nouns refer. Human beings make aspectual distinctions quite automatically, without conscious thought. States, activities, etc. impress themselves on our notice, organizing the way we see the world. As Roger Brown comments in *Words and Things*, humans probably form certain concepts without language, particularly "conceptions of space, time, causality, and the enduring object" (1958:195). Among such concepts are states and different types of events.

Evidence for this claim can be adduced from the field of language acquisition. Children make aspectual distinctions easily, without being taught. This fact suggests strongly that they are perceptually and cognitively based. Perhaps the most basic distinction is that between states and dynamic events. Children acquire very early certain linguistic forms that recognize this distinction. In English, for instance, the progressive occurs only in dynamic sentences. Roger Brown notes in his detailed study of language acquisition that the progressive is the first inflectional form produced by children, and that it appears almost without error from the beginning (Brown 1973:324-8). In other words children's early utterances with the progressive are dynamic: they do not say things like **I am loving you.* (* indicates ungrammaticality). This sentence is ungrammatical, because it is progressive and presents a stative situation. Kuczaj 1979 substantiates Brown's observations, citing children's creative verb formations which show abstract knowledge that goes beyond the correct use of individual forms. These observations suggest strongly that the distinction between stative and non-stative is made very early, on a cognitive basis.

Additional acquisition evidence comes from the study of many different languages, including Turkish, Italian, Japanese, and Polish. Aksu 1978 studied three Turkish children who were just under 2 years of age; she reports that their acquisition of the past tenses showed awareness of the distinction between stative and non-stative situations. The children first acquired the *di* perfective and the *iyor* imperfective pasts, both of which appear only with non-statives. Further, Aksu's evidence suggests that the children distinguished between events according to whether or not they involve changes of state. Aksu's subjects used the *iyor* past with atelic verbs and the *di* past with telic and change of state verbs; in the adult language these tenses appear with non-statives generally, cf 1978: 50-52. (Situation aspect holds of sentences, as I will show directly; but some studies discuss verbs only. I indicate this by referring to verb type rather than situation type in discussing the study.)

Similar evidence has been presented for Italian. According to Antinucci & Miller 1976, the distinction between stative and non-stative is one of the earliest made by

children learning Italian. Further, Antinucci & Miller show that children learning Italian create a past-participle-object agreement rule that applies only to sentences presenting telic situations. This similarity in the acquisition patterns of different languages constitutes impressive evidence for a cognitive distinction between stative and non-stative situations. See also the discussions of the acquisition of Polish and Japanese in the references below.

Another type of evidence comes from the systems of diverse languages, that is, from language universals. The aspectual distinctions explored in this book appear in the grammars of many strikingly different languages, although not all distinctions are honored in all languages. A partial list includes: Bulgarian (Lindstedt 1985), Chi-Bemba (Givon 1972), Chinese (Li & Thompson 1981, Smith 1987), English (Vendler 1967), Finnish (Heinämäki 1983), French (Garey 1957, Rohrer 1978, Smith 1987), Georgian (Holiskey 1981), German (Hoepelman & Rohrer 1981), Japanese (Jacobsen 1982, 1984), Kikuyu (Johnson 1981), Korean (Kim 1982, Ahn 1995), Lakhota (Foley & Van Valin 1984), Navajo (Hardy 1978, Midgette 1988), Polish (Weist et al 1984), Russian (Timberlake 1982, Brecht 1985), Serbo-Croatian (Cochrane 1977), Spanish (Talmy 1985, Westlake 1995).

3. This book has three goals: I present the two-component theory of aspect, formalize it within the framework of Discourse Representation Theory, and show in detail how the theory applies to five languages. Discourse Representation Theory provides semantic representations which include both a conceptual and a truth-conditional level of meaning and a procedural, process-oriented treatment. These features are particularly appropriate for the domain of aspect. The theory allows the integration of aspect with other semantic features of sentences, including temporal location.

The languages studied—English, French, Russian, Mandarin, and Navajo—are from three language families. Although English, French, and Russian are all Indo-European, their aspectual systems are quite different. Russian is important because of its salient aspectual system and the strong Slavic tradition of work on the topic of aspect. To be taken seriously, a general theory of aspect must account insightfully for the Russian system. The other languages are less well-studied (as of 1991; the situation is changing rapidly). Mandarin Chinese is a Sino-Tibetan language. Typically for this language family, Mandarin has a rich aspectual system and is morphologically simple. Navajo is an American Indian language of the Athapaskan family. Navajo is spoken in New Mexico and Arizona. The language has a distinctive pattern of lexicalization, an intricate morphology, and a notoriously complex set of aspectual morphemes.

These languages were chosen for rather personal reasons. I work at a level of detail which requires real familiarity with a language. It was clear that I would be able to present studies of only a few languages, but variety was important since I was seriously interested in a general theory. I was fortunate in being able to work on Russian with my colleague Gilbert Rappaport, of the Department of Slavic at the University of Texas. I do not claim to have chosen a representative sample of languages; still, the ones analyzed here are different enough to challenge the range of the two-component theory of aspect.

In the first section of this book I present the general theory and show how it functions as a parameter of Universal Grammar. Chapter 1 introduces the theory; Chapters 2 to 4 discuss aspectual situation types and viewpoints; Chapter 5 discusses temporal location and how it interacts with aspect. Chapters 6 and 7 deal with formalization of the theory in semantic and conceptual terms. Part II applies the theory to the analysis of five languages which differ conspicuously in their aspectual systems.

CHAPTER 1

THE APPROACH

1.1 The General Theory

In this Chapter I introduce the theory of aspect developed in this book, and show how it provides for both a general and specific account of aspectual systems. Aspect is a parameter which is realized differently in languages of the world. An adequate theory of aspect must account for the similarities and the differences in aspectual systems. The two-component theory is abstract enough to do this. The theory also allows precise statements of the systems of particular languages.

Aspect traditionally refers to grammaticized viewpoints such as the perfective and imperfective. Recently, as people have come to appreciate the relation between viewpoint and situation structure, the range of the term 'aspect' has broadened. The term now includes temporal properties of situations, or situation types. (The terms 'internal event structure' and 'Aktionsart' are also used for the latter; see Comrie 1976) Viewpoints and situation types convey information about the temporal aspects of situations such as beginning, end, change of state, and duration. This notion of temporality is distinct from temporal location, although related to it. Aspect is the semantic domain of the temporal structure of situations and their presentation.

The point of view of a sentence is conveyed by the explicit and implicit meanings the speaker chooses (Beardsley 1966). In understanding aspectual meanings we elucidate some of the content of point of view. Viewpoint aspect gives temporal perspective to a sentence. More subtly, situation aspect also involves point of view. As I will demonstrate, situation aspect presents a situation as belonging to a certain category of event or state.

The composite nature of aspectual meaning is an essential part of the two-component theory. The aspectual meaning of a sentence is a composite of the information from the components of viewpoint and situation

tion will be stated in the semantic representations of Discourse Representation Theory. The representations allow a precise account of semantic meanings and a basis for computing conversational meanings.

At the level of universal grammar, the theory of aspect provides an account of the formal structure of aspectual systems and of their substantive dimensions. The aspectual systems of individual languages must be stated individually. The viewpoint categories have a parameterized structure, following Chomsky 1981.[1] Universal grammar defines the basic categories according to temporal properties. These properties underdetermine a category, allowing for the variations that occur among languages. Consider, for instance, the perfective viewpoint. The universal statement requires that it focus both endpoints of a situation. States are excluded by this requirement because they do not include endpoints (see Chapter 2). Yet in some languages the perfective viewpoint applies to states. There are other constraints on the perfective viewpoint: the Russian perfective applies only when a predicate is explicitly quantized. Departures from the universal statement represent marked values.

Universal Grammar also defines the principal situation types. Like other cognitive categories they have a prototype organization. There are variations among languages. The clusters of aspectual properties that appear in the general account, and in the grammars of individual languages, are drawn from the stock of temporal properties that characterize the temporal structure of situations.

1.1.1 The Two Components in Sentences

Sentences present information about aspectual situation type and viewpoint. The two types of information are independent. This essential point was illustrated in the Introduction; I give some additional examples here to facilitate discussion. The examples are English; other languages are discussed later.

The receiver of a sentence knows how much of a situation is presented, and to what situation type it belongs. Consider the aspectual information conveyed to the receiver of (1):

(1) a. Mary walked to school.
b. Mary was walking to school.
c. Mary walked in the park.

(1a) presents a complete event that has a goal, or natural endpoint, and the information that the goal was reached. (1b) presents a part of the same type of event, but does not convey whether the goal was reached. (1c) presents a complete event that does not involve a goal, and the information that the event was terminated.

This information is given by the linguistic forms that appear in a sentence. Situation type is conveyed by the verb constellation, which I define as a main verb and its arguments, including subject. Viewpoint is conveyed by a grammatical morpheme, usually verbal. Adverbials may give relevant information; see Chapters 3 and 5.

Aspectual viewpoints present situations with a particular perspective or focus, rather like the focus of a camera lens. Viewpoint gives a full or partial view of the situation talked about. The viewpoint gives a full view in (1a) and (1c), a partial view in (1b).

The situation type of a sentence indirectly classifies the event or state talked about according to its temporal properties. I distinguish five types of situation: State, Activity, Accomplishment, Semelfactive, Achievement. They differ in the temporal properties of dynamism, durativity, and telicity. (2) summarizes with typical examples:

(2) Situation types
States: static, durative (know the answer, love Mary)
Activity: dynamic, durative, atelic (laugh, stroll in the park)
Accomplishment: dynamic, durative, telic, consisting of process and outcome (build a house, walk to school, learn Greek)
Semelfactives: dynamic, atelic, instantaneous (tap, knock)
Achievement: dynamic, telic, instantaneous (win a race, reach the top)

The distinction between telic and atelic events turns on whether an event has a natural final endpoint: a goal, outcome, or other change of state. Telic events have natural final endpoints, whereas atelic events do not. The classification is discussed in detail in Chapters 2 and 3.

There are three main viewpoint types, perfective, imperfective, and neutral. Their properties are summarized below:

(3) Viewpoint types
Perfective viewpoints focus a situation in its entirety, including both initial and final endpoints.
Imperfective viewpoints focus part of a situation, including neither initial nor final endpoints.
Neutral viewpoints are flexible, including the initial endpoint of a situation and at least one internal stage (where applicable).

The viewpoints are similar across languages, but not identical. Knowing a language includes knowing the semantic value of its viewpoints, and their distribution according to situation types. Viewpoints are discussed in Chapter 4.

To introduce the theory more specifically, I offer a schematic representation of the aspectual information which is conveyed by sentence (1b) above. The sentence presents a situation of the Accomplishment type with the imperfective viewpoint. (4a) gives the informal temporal schema for an Accomplishment: I and F represent initial and final endpoints, the dots represent the internal stages of the event. (4b) gives a temporal schema for the imperfective viewpoint: the dots represent an interval consisting of internal stages of a situation. (4c) is a composite of the two schemata; the slashes indicate the interval of the situation presented in the sentence. The linguistic forms that realize the temporal schema are given to the right on each line. Tense is not represented here.

(4) Temporal schema for *Mary was walking to school*
a. I . . . . . F (Accomplishment) Mary walk to school
b. . . . (Imperfective) be+ing
c. I . ///. . F (Composite) Mary walking to school

The slashed period represents an interval of Mary's walking to school, an interval that includes neither the initial nor the final endpoint. Thus the aspectual of a sentence is a composite of viewpoint and situation type information. The composite schema of a sentence correctly allows the components to retain their independence. Viewpoint does not obscure the essential properties of the situation whether or not it presents the situation with both endpoints. Formalization of aspectual information is discussed in Chapters 6 and 7.

Aspectual meaning holds for sentences, rather than for individual verbs or for verbphrases. This was first shown for Dutch and English by Verkuyl 1972. Verkuyl argued that the situation type of a sentence is determined not by the verb alone but by the verb constellation (and associated adverbials, discussed later). The evidence comes from sentences of different situation types which differ only in complements of the verb or the internal structure of verb arguments. For example, (5) and (6) present pairs of sentences differing in telicity:

(5) a. Mary walked in the park. (atelic)
b. Mary walked to school. (telic)

(6) a. Edward smoked cigarettes. (atelic)
b. Edward smoked a cigarette. (telic)

(5a) has a Locative complement, whereas (5b) has a Directional complement. The object nounphrase of (6a) refers to an uncountable quantity, whereas the object of (6b) refers to a specific quantity. The events are different in specificity. Smoking a particular cigarette has a clear final endpoint, when the cigarette is finished; but smoking cigarettes is an atelic event that may continue indefinitely.

Verkuyl also presented examples in which subjects and indirect objects affect situation type. In (7), the subjects differ in specificity:

(7) a. Famous movie stars discovered that little spa for years.
b. A famous movie star discovered that little spa.

(7a) is atelic, (7b) is telic. The sentences have different adverbials, another factor in their aspectual meaning.

The examples show very clearly that situation type meaning is compositional: it is built up with the verb, arguments and adverbs of a sentence. These matters are discussed further in Chapters 3 and 6.

1.1.2 Aspectual Systems in Language

I turn now to the question of how the two aspectual components are realized in the grammar of a language. 'Grammar' refers to the system of rules—lexical, morphological, syntactic, and semantic—that generates and structures the sentences of a language. Aspectual systems have consistent properties, although their linguistic expression varies across languages. The components of viewpoint and situation type constitute closed sub-systems, offering the speaker choices that are limited and obligatory.

The linguistic forms of a language are deployed in sentences by grammatical rules, which relate underlying structures to surface forms and to meanings. Classically, linguists distinguish two classes of surface linguistic forms: lexical morphemes and grammatical morphemes (Sapir 1921:26). Lexical morphemes are usually referring expressions which refer to entities, events, or concepts. The class of lexical morphemes is open, since all languages have productive lexical rules. In contrast, grammatical morphemes express grammatical functions and relationships. The class of grammatical morphemes is limited, or closed, for a given domain.

In composing a sentence, the speaker must select grammatical morphemes as required for a given language. For instance, English nounphrases require a determiner and number; English verbs require tense. The choices of each closed domain contrast with each other, so that part of the meaning of a choice is its contrastive value. Consider for instance the expression of nounphrase number in English and Arabic. English has two possibilities for number, singular and plural; the value of the plural is *two or more*. But the Arabic system offers three possibilities: single, dual, plural. The value of the Arabic plural is therefore *more than two*. These examples show that the value of an alternative depends on the possibilities offered by the system.

The domain of aspect offers choices from two closed systems. There is a small, fixed set of viewpoints and a small set of situation types; one of each must be chosen when a sentence is framed.

Viewpoint aspect is signaled by grammatical morphemes that contrast, forming a closed system. Viewpoint morphemes often appear in the verb-inflectional system of a language (see the survey in Steele 1981). Across languages the viewpoint systems vary considerably. Mandarin Chinese offers several choices: three perfectives, two imperfectives, and a neutral viewpoint. Not all languages offer a choice between viewpoints: some have no overt viewpoint morphemes. Finnish and Icelandic are of this type. I will claim that such languages have a neutral viewpoint (Chapter 4).

Situation aspect is expressed by the verb constellation. Verb constellations are associated with particular situation types (stative, activity, etc.). The situation types function as linguistic categories, though they are not marked overtly. The verb constellations and sentences of each situation type have a distinctive set of syntactic and semantic properties. These properties justify their status as linguistic categories. The situation categories correspond to the notion of covert category introduced by Whorf (1956).

The two components of an aspectual system interact with each other. One dimension of difference among languages is the generality of the interaction. Aspectual viewpoints may have a limited range: in English, Navajo, Russian and Chinese they require certain situation types, whereas in French they apply to all. (For simplicity, I will refer to Mandarin Chinese as 'Chinese' throughout this book.) Languages also vary in how viewpoint relates to the category of tense. English viewpoint contrasts appear in all tenses; in French and Russian, the past tenses offer viewpoint contrasts but the present and future do not. Differences among aspectual systems are discussed in Part I and developed in detail for particular languages in Part II.

Summarizing, aspect is a semantic domain which is expressed in linguistic categories. Aspectual meanings are grammaticized through viewpoint and situation type categories. The categories of viewpoint aspect are overt, whereas situation aspect is expressed in covert categories.

1.2 *Aspectual choice*

Aspectual choice allows the speaker to talk about situations in more than one way. This latitude gives the domain an important subjective component. In this section I consider the nature of aspectual choice. To understand it, we must consider the relation between speakers, sentences, and the actual situations talked about in sentences. Speakers choose aspectual meanings in order to present situations from a certain point of view, focus, or emphasis. The choices are not unconstrained. Aspectual choice is limited by conventional categorization, pragmatics, and the constraint of truth. Nevertheless there is a very clear sense in which the aspectual meaning of a sentence reflects the decision of a speaker to present material in a certain way. Grammarians of all traditions have recognized aspect as a domain in which subjective factors are of paramount importance.[2]

Situations may often be presented with more than one viewpoint, according to the choice of the speaker. For instance, the French sentences below may be used for what is objectively the same situation. (8a) has the *Passé Simple*, a past perfective tense; (8b) has the *Imparfait*, a past imperfective tense. They may both be translated by (8c):

(8) a. Il regna pendant trente ans.
b. Il regnait pendant trente ans.
c. He reigned for 30 years.

(8a) presents the event as closed, with a well-defined beginning and end, whereas (8b) presents the event as open. Closed events have both endpoints, in our terms; open events have no endpoints. The distinction between closed and open events may pertain not to real time but to conceptual time (Kamp & Rohrer 1989: ch 1, p 15-16).

Closed presentations are punctual, in that they tend to present an event without concern for its internal structure. As Lyons puts it, "Looked at from one point of view a 30 year reign is as much an event as is a sudden explosion or a flash of lightning. It all depends on whether the person who refers to the situation in question . . . treats it one way rather than another" (1978: 709-710). In this sense the difference between the examples of (8) is a conceptual one. Punctual viewpoint presentation is discussed in Chapter 4.

Choices are also available to the speaker in the situation type of a sentence, as in the examples of (9).

(9) a. The ship moved.
b. The ship was in motion.

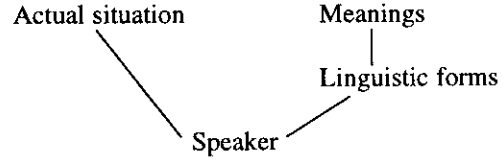
(9a) presents an Activity, a dynamic situation type, while (9b) presents a State. Since States are static and unchanging, the sentences contrast with each other in the key properties they ascribe to the situation.

This approach to speaker-based aspectual choice relies on situation types as concepts of idealized situations. The situation types of a language represent idealized situations which are grammaticized in the language. (Since I am concerned with aspect here, I define the idealizations only by temporal characteristics.) The situation types

are idealizations, drawn from the temporal classifications of actual situations that people make on perceptual and cognitive grounds. In what follows I will pursue that idea that speakers call on such idealizations when they talk about situations in the world.

The speaker links an actual situation to a meaning by talking about the situation with a particular set of linguistic forms, a verb constellation. The relation between situations and sentences is indirect: it is mediated by the speaker. The speaker, not the situation, determines aspectual choice, as indicated by the diagram in (10).

(10) The relation between situations, speakers, forms, and meanings



According to this model, in talking the speaker presents an actual situation as an examplar of a given situation type, from a given viewpoint. The speaker does this by using the linguistic forms associated with that situation type and viewpoint.

In associating an actual situation with a given idealization one emphasizes certain aspects. Standard choices focus on aspectual properties that are salient at the basic level; non-standard choices focus on other properties. For instance, consider again the sentences of (9). I use square brackets to present verb constellations. (9a) presents [The ship move] as an event (*The ship moved*). In (9b) the verb constellation is presented as a state (*The ship was in motion*). The former is the conventional choice, according to the properties that are salient perceptually and functionally. The latter has a special effect: it freezes the motion. Note that receivers will not be misled by unconventional choice. The basic verb constellation can be recovered from the sentence. Knowing a language includes the standard, basic associations of verb constellation with situation type.

Choices in the aspectual domain allow speakers to talk about situations in aspectual terms that seem to contradict each other. Such differences involve point of view rather than contradiction. For instance, the sentences of (8) present a situation as both punctual and durative. But there is no real contradiction. The sentences do not make contradictory claims. Instead, they present the event [reign for 30 years] differently. In sentences like those of (8) and (9), the contrasting idealized situation types express point of view and emphasis rather than contradictory meanings.

There are some cases where aspectual choice has consequences for the truth-conditional meaning of sentences. Use of the perfective viewpoint may commit the speaker to a claim about the event in question. Consider the examples of (11):

(11) a. Stephen walked to school.
b. Stephen was walking to school.

Depending on which sentence I utter, I am responsible for different claims about what happened. (11a) commits me to the claim that Stephen got to school, whereas (11b) makes no such claim. This exemplifies a general principle, to which I will return, that

speakers have more latitude in presenting an open situation than a closed one. The use of a certain viewpoint may sometimes be misleading rather than false. I discuss these cases in Chapter 4, after introducing the pragmatic conventions which are associated with aspectual choice.

Truth conditions often underdetermine aspectual choice. The sentences of (11), for instance, will be true under many of the same circumstances. To understand such choices requires a principled account that is not limited to truth-conditional considerations. What we need are pragmatic principles, or conventions. I will propose some pragmatic conventions which underlie aspectual choice. They involve the contrastive value of the terms of a closed system; standard and non-standard choices; shared information between speaker and receiver; and other considerations. The conventions are principles for language use. They are flexible, unlike the relatively firm rules of sentence grammar. Pragmatic conventions of use are discussed in Chapter 4, and for individual languages in Part II.

In the speaker-based approach, the aspectual meanings of a sentence are the choice of the speaker, assuming truth as a general constraint. Choice is made according to the grammar of the language and the pragmatic conventions of use for that language. The speaker expresses a given aspectual meaning by choosing the linguistic forms associated with that meaning.

1.3 The Structure of the Aspectual Components

1.3.1 The Logic of Markedness

In framing sentences, speakers make choices within two closed aspectual systems. They associate a given situation with a situation type, according to the properties that are functionally and rhetorically salient. They choose an aspectual viewpoint on the basis of the information it gives and pragmatic convention. Standard and unusual choices can be distinguished for both components of aspectual meaning. The ideas of markedness theory are useful in understanding choices within members of a closed system.

The notion of markedness was introduced by linguists in the structural tradition, notably Roman Jakobson (1932), Trubetzkoy (1939) and other members of the Prague School (cf Vaček 1964). These scholars devoted much attention to the analysis of closed systems in phonology and morphology. They were interested in the formal and notional distinctions that underlie such systems, particularly in the contrast inherent in the choice of a given term. Markedness concerns the type of relations that hold among the members of a system. It has ramifications in many areas of language.[3]

Within a closed system, one term is often simpler and/or more general, and the other(s) more complex and/or more specific. The more general term is 'unmarked', the more specific is 'marked'. The marked term of a contrasting pair tends to be more complex in form than the unmarked member. The marked form may have an overt morpheme, while the unmarked form is indicated by zero. For instance, in the pair of Russian verbs *çitat-proçitat* (atelic vs telic 'read') the form *çitat* is simpler morphologically and semantically.

Markedness theory can be used for the semantic analysis of closed systems. Closed systems have different types of semantic contrast, or opposition, that hold between their terms. Closed systems may be 'symmetrical' or 'asymmetrical'. In a symmetrical system the terms divide up a domain with contrasting positive values. The terms of such systems are 'equipollent'. Take the values of tenses in a hypothetical tense system as an example. A symmetrical tense system might have two tenses, past and present; each tense would have a positive semantic value that excluded the other.

The Prague School scholars were particularly interested in the contrasts of asymmetrical closed systems. They distinguished two types of asymmetrical contrast, 'privative' and 'subordinative'. In a 'privative' contrast one term gives positive information about a property, the other gives negative information about that property. For instance, a tense system might have two tenses, past and non-past. The past tense would denote the positive property of pastness, the non-past its absence. In a privative contrast the positive term is marked because of its greater specificity. In a 'subordinative' contrast, one term indicates a positive property and the other gives no information about that property (Chvany 1975:82). A subordinative tense system might have a contrast between a past tense and forms that are compatible with any time, including past. Jakobson suggests such an account of the Russian tense system.[4]

Subordinative contrasts are quite common in linguistic closed systems. Greenberg explains their frequency as due to "the (human) tendency to take one of the members of an oppositional category as unmarked it represents either the entire category or *par excellence* the opposite member to the marked category" (1966:25).[5]

Aspectual viewpoints form closed systems with contrasting terms *par excellence*. The viewpoints of Russian were analyzed by Jakobson within the theory of markedness. Russian has a perfective and an imperfective viewpoint. Jakobson gives an asymmetric, subordinative analysis of the contrastive relation between them. I summarize it briefly here. Assume that Property A holds of a viewpoint if it presents the endpoints of a situation. The perfective viewpoint has this meaning: it specifically states the presence of property A. The perfective has an overt prefix. The perfective is therefore the marked term semantically and morphologically. In contrast, the imperfective is noncommittal about A and has no overt prefix: it is the unmarked term (1957:136). The relation between the viewpoints is subordinative.

The semantic asymmetry between aspectual viewpoints explains much about their use. The imperfective is appropriate in many cases where the perfective is not, because it is less specific. Often if a situation warrants the use of the perfective viewpoint, the imperfective viewpoint may also be used. But use of the imperfective does not necessarily warrant the perfective.

However, there is another analysis of the viewpoints, which is based on the information conveyed by a viewpoint rather than its contrastive value. In this approach the viewpoints of Russian have an equipollent relation: each gives positive information about an aspect of a situation. The perfective gives information about endpoints, the imperfective gives information about internal stages. This approach accounts for other patterns of use.

Both of these analyses seem correct, and both will be used in the approach developed in this book. The positive analysis gives the information licensed by each view-

point. This information is semantic, and appears at the semantic level of representation in Discourse Representation Theory. The subordinative analysis proposed by Jakobson emphasizes the contrastive values of the viewpoints.

Contrastive values are pragmatic in nature, since they affect the choices that a speaker makes between a limited set of terms. I will propose a set of pragmatic conventions of use for the viewpoint categories of a language. Some of the conventions are based on general considerations, others are driven by the particular language. The conventions take contrastive value into account. They hold for special uses of aspectual categories, such as the well-known 'Statement of Fact' of Russian (Chapter 10). They also give an account of some common aspectual interpretations, including the tendency to interpret perfective viewpoints as past and imperfective as future in languages without tense. Pragmatic conventions of use are discussed in Chapter 4 and in the Chapters on individual languages.

1.3.2 Markedness, Categorization, and Aspectual Choice

The ideas of markedness can be extended to many domains. I shall use it in discussing aspectual choice. Standard choices are unmarked; non-standard, unexpected choices are marked. Marked aspectual choices include unusual associations between situations in the world and linguistic situation types, as in the examples of ship motion above.

Speakers make marked aspectual choices for pragmatic reasons. While standard choices follow conventional principles of association, marked associations violate them. In violating these conventions one conveys a special meaning (Grice 1975). The conventions are like discourse principles in that their violation is significant.

The notion of marked and unmarked situation type choice implies a basic, neutral set of associations between situations in the world and idealized situation types. There are such associations. They are based on factors such as causation, perceptual salience, and function. Many standard associations involve the chunking of events into a functional unit. For instance, consider the event of producing a cake. One assembles the ingredients, turns on the oven, measures the flour, beats the eggs, combines the ingredients into a batter, puts the batter in a pan, puts the pan in the oven, etc. These events are standardly seen as one event: [make a cake] is the verb constellation that denotes it. Of course, one may also choose to refer to one of the sub-events.

The conventional ways of viewing and categorizing events are reflected in the words and phrases of a language. They are the stereotypes of a language and a culture. The stereotypes reflect conventional levels of detail in categorizing events. Commonly making a cake is taken as a single event. To take another example, if I see Daniel moving his feet and body in a certain manner I am likely to say *Daniel is walking* rather than *Daniel is taking steps*; although the narrower focus is available as well. This type of conventional categorization of events is similar to the way people standardly categorize objects. There are many names for objects, varying in focus and levels of detail, but usually one name (and the corresponding conceptual category) is taken as basic, and is preferred. The notion of a basic level comes from psychology.

Psychologists recognize a basic-level of categorization of objects and actions, following Roger Brown. At this level, categories are natural (rather than artificially constructed); they have short and frequently used names; they are learned early. Consider the names of animals. For most animals, a certain name is taken as basic, and is generally preferred. Thus *dog* is basic for most people in a way that *terrier* and *animal* are not. Basic-level names often have a functional basis and are in the middle of the taxonomic hierarchy, Brown points out (1958: 217-21). Experimental evidence for the primacy of basic-level categorizations is given in Rosch et al 1976. The conclusion is clear: although people categorize things in more than one way, not all categories have the same cognitive status. This conclusion has interesting implications for the treatment of aspectual choice. I shall say that standard, basic-level choices are 'unmarked,' while choices that depart from the standard are 'marked.' This notion of markedness is related to that of the Prague School, but not identical to it.

Speakers may make a basic-level link between an actual situation and a situation type idealization; or a marked link. The unmarked way of referring to an event is as a complete, functional whole. Similarly, there are basic and marked viewpoint choices. The speaker chooses aspectual categories from each component, partly in accord with convention and partly to present a particular focus.

Marked choice and grammaticality: The notion of marked aspectual choice is based on categorization, not grammaticality. Marked aspectual choice is often perfectly grammatical, as in the examples discussed so far. The particulars depend on the resources of a particular language. Certain choices are both grammatically and conventionally marked: well-known examples of this type are progressive stative sentences of English, as in (12):

(12) a. The cake has been looking done for the last 5 minutes.
b. Peter is believing in ghosts these days.

These sentences are grammatically marked because they have stative verb constellations and the progressive viewpoint. Standardly, the progressive requires event verb constellations.

Sentences like those of (12) are very common in English, and are taken as marked rather than ungrammatical. They have a certain color and emphasis, as many scholars have noticed. I have argued that such sentences present states as events. The progressive stative has the linguistic forms reserved for events, thus endowing a state with the dynamism of an event. The progressive stative construction is discussed further in Chapters 2 and 8. The marked use occurs in other languages that have constrained progressive viewpoints.

Whether marked aspectual choice involves grammaticality depends on the language. Some languages have extensive morphological resources, others have few. In languages which constrain viewpoints to particular situation types, there is always the possibility of sentences that are both aspectually and grammatically marked.

1.3.3 Situation type categories and prototype theory

Current notions of how human categories are organized enable understanding of the situation types as conceptual semantic categories. Traditionally the members of a cat-

egory all have a set of defining properties. But recent work has suggested another view, known as 'prototype theory.' In this theory, many human concepts have a central meaning, or prototype, which consists of a set of properties. Prototypical members of a category have many of the characteristic properties; less central members have fewer of them.

Prototype theory is based largely on important work by Eleanor Rosch. Rosch has shown that human cognitive categories have a central group of examplars to which all members of the category bear a family resemblance (1973, 1978). These are the prototypes of the category. The notion of family resemblances between members of a category, rather than sets of necessary and sufficient conditions, is based partly on Wittgenstein's ideas (1953: 32 et seq). Wittgenstein discussed word meanings and games. For the category of games, he showed that there is no set of properties that all games have in common. Instead there are clusters of overlapping properties. The notion of family resemblance and varying properties applies to categories of many kinds.

Central exemplars of a category have more of the characteristic properties than do marginal exemplars. Consider the concept {bird}, for instance. Members of this category tend to have wings and to be able to fly. Sparrows are better exemplars of the category {bird} than penguins: both have wings, but only sparrows can fly. Experiments show that people agree to a striking extent about the central and marginal exemplars of a category (Rosch 1978). When asked to rank exemplars of the category {bird}, people tended to rank sparrows and robins high, ostriches and penguins low. Ostriches and penguins are marginal cases. People are often unsure about marginal cases, because they have properties of more than one category. The prototypical approach allows for unclear cases as well as clear ones.

The concepts associated with words are organized in a similar manner. The central exemplars have a cluster of properties which are essential to the concept. The philosopher Hilary Putnam suggests that the meaning of a word can be represented by a stereotype, a central exemplar for the concept. This central case is undisturbed by marginal examples. For instance, the notion of {tiger} includes stripes. Imagine a very unusual creature with many features of a tiger, but lacking in stripes. We might say that the creature was a tiger anyway. Whether the creature was technically a tiger is a matter which, as Putnam stresses, would not interfere with the standard conventional use of the word *tiger* (Putnam 1976: 247). The prototype model is useful in many domains, and I will assume it here.

There is an ongoing debate about whether prototype effects mirror the internal organization of categories. Rosch 1973 argues that they do; Rosch 1978 takes a different approach. Osherson and Smith 1981 point out some difficulties that arise for overlapping properties within a prototype organization. Lakoff presents a useful discussion of the principles of categorization, and a somewhat different proposal for the organization of categories and concepts (1987: Ch 2,3).

The aspectual situation types are categories which lend themselves to the prototype approach. The temporal schema of a situation type gives the cluster of properties that are central to the category. Category members have some or all of these properties.

1.4 The Parameter of Aspect and Universal Grammar

The concepts of aspect play a role in all languages, so far as we know. The aspectual systems of different languages are strikingly similar. They also vary in subtle and not-so-subtle ways, as documented in the second part of this book. I propose here a Universal Grammar account of aspect. Aspect is a parameter along which languages differ. We define in Universal Grammar a maximally general aspectual system. It has the aspectual categories that generally occur in languages of the world. We predict differences among the aspectual systems of languages, insofar as they vary along the dimensions of the parameter. The topic of parametric variation is discussed in recent generative work (Chomsky 1981, 1988, Roeper & Williams 1987).

Universal Grammar provides the formal structure of aspectual systems: the components of situation aspect and viewpoint aspect, and their interaction in sentences. The categories of both aspectual components are directly related to the temporal structure of situations. I propose that the temporal structure of situations is the substantive basis for the aspectual categories of language.

Abstracting away from the differences between situation types, and from non-temporal factors, we arrive at a schematic picture of the temporal structure of situations, given below. Capital letters indicate the endpoints; dots represent stages. In principle a situation may have preliminary stages, internal stages, and resultant stages. All of these possibilities are represented in (13): it is a skeleton schema that does not represent any particular situation type.

(13) Abstract temporal structure of situations:
. . . I . . . F. . .

This schema defines the possible meanings of aspectual situation types and viewpoints. Without predicting the precise properties of situation types and viewpoints, one can delimit their range. There are several types of endpoints; the endpoints of an event may have internal structure; events may be instantaneous, lacking internal stages; etc. These and other variations are discussed in detail in this book.

Universal grammar presents the basic categories with defining properties for each category. The defining properties generally underdetermine a category. Following prototype theory, I suggest that aspectual categories have a cluster of defining properties. The variations that occur are departures from the simplest and most general characterization of a category. This approach allows us to claim that aspectual categories have the same basic properties across languages.

The approach may be compared to the stronger and simpler traditional view, which posits a simple invariant meaning for each aspectual category. The notion of invariance is attractive. It seems to explain the striking similarity of aspectual categories in languages of the world. But as Dahl points out, the idea of a simple invariant meaning for aspect is futile because it cannot account for the facts (1985:74). The more complex prototype approach posits clusters of properties for aspectual categories. This allows us to maintain the basic idea of invariance, a *Gesamtbedeutung* for aspectual categories.

Aspectual systems must be stated separately language by language. The meanings grammaticized in language vary, as do the linguistic forms. The claim here is that variation does not exceed the bounds of the general universal schemata. For instance, the stereotype of an Achievement event is instantaneous. Beyond this defining property the concept of Achievements varies: in some languages the temporal schema includes preliminary stages, in others it does not. The parametric approach also allows for marked situation types and viewpoints that occur only in a particular language.

There are aspectual meanings that do not pertain directly to the temporal structure of a situation. In certain African languages, for instance, emphasis is coded by morphemes of a viewpoint component with perfective and imperfective viewpoints. Certain viewpoints convey adverbial and/or agentive emphasis. This is true in Chi Bemba, according to Givon 1972, and in Wolo (Fiona McLaughlin, personal communication). Such meanings are not predicted by the schema above and must be learned individually for a language.

The domain of temporal location is closely related to aspect. The two domains are complementary. Temporal location takes an external viewpoint of a situation: tense and time adverbials locate a situation in time. Aspect presents the internal structure of a situation. There is considerable interaction between the two domains. Morphologically, tense may also express an aspectual viewpoints. Distributionally, there are constraints on the occurrence of certain tenses and adverbials with aspectual categories. Semantically, aspect and temporal location are closely intertwined in the interpretation of sentences. And as work in Discourse Representation Theory emphasizes, aspect and temporal location are essential to understanding narrative time in texts (Kamp & Rohrer 1983, Kamp & Reyle 1993).

This approach provides a satisfying locus for the aspectual categories and their properties. In the long tradition of research on aspect many people have attempted to identify its essential dimensions. Some scholars identify a set of basic aspectual oppositional categories. Friedrich 1974, for instance, suggests that the oppositions of duration, completion, and totality are basic. This type of approach suffers from a certain arbitrariness: there is no principled reason for the choice of basic categories. Moreover, the oppositions have a hierarchical rather than a prototypical organization and therefore cannot do justice to the multiple factors of aspectual meaning. Dahl 1985 takes an approach closer to the one pursued here. Dahl claims that aspectual categories have prototypical structure and that languages differ in its realization. However, prototypical category structure does not suffice either. The theory should explain and predict the aspectual systems of language. The theory presented here does this by taking the temporal structure of situations as the basis of aspectual categories.

Notes

[1] The approach of principles and parameters is introduced in Chomsky 1981 in connection with the notion of a core grammar. The core grammar of any language is given by Universal Grammar as a set of principles with possibilities of parametric variation. The values of certain parameters can only be determined by primary data from the language. "In a highly idealized picture of language acquisition, Universal Grammar is taken to be a characterization of a child's pre-linguistic state. Experience..serves to fix the parameters" (1981:7).

[2] The role of subjectivity in the aspectual domain is well known to grammarians. Among those who give it particular attention are Jespersen 1931, Benveniste 1966, Jakobson 1957; more recently Leech 1970, Lyons 1978, Comrie 1976, Dahl 1985.

[3] The ideas of markedness theory are often generalized to apply beyond closed systems. Indeed, the notion of core grammar (note 1 above) is often contrasted with grammatical periphery as unmarked and marked (Chomsky 1981). Core grammar is basic, standard, and unmarked; non-core or peripheral grammar is special, and marked.

[4] Jakobson 1932/1971 analyzes the Russian tense form in -L as expressing past time and the so-called "present tense forms" (those in -o- or -i-) as making no statement about past time. So the form in L will be compatible only with contexts where the reference is to past time, whereas the unmarked forms can be used regardless of time references of the context. (Brecht nd: ch 2, p 33).

[5] The distinction between the privative and subordinative opposition is an important one. In explicating it for Russian aspect, Chvany gives the example of the 'privative' opposition between the forms of the perfective and imperfective and their semantic values. "The syntactic features are in privative opposition, "A" vs. "non-A": a verb in use is either perfective, or it is not . . . (but) the semantic opposition for each form is "A" vs. "No statement of A" . . . "Chvany notes that this kind of opposition has been termed subordinative to distinguish it from the privative, originally by Miroslav Janakiev (1975:82).

CHAPTER TWO

SITUATION ASPECT

In this Chapter I discuss the situation types at an abstract level that holds across languages. I will be interested in their temporal properties, and the central and less-central cases. I will also consider the verb constellations and sentences of each situation type.

2.1 Basic-Level and Derived-Level Situation Types

Situations have long been classified by their internal temporal features.[1] Aristotle distinguished between static and dynamic, or states and events; others have added the features of telicity and duration.[2] The features are based in human perceptual and cognitive abilities. Situation types are semantic categories of language, classes of idealized situations with distinctive temporal features.

The interesting point for linguistic analysis is that the semantic situation types have grammatical correlates. In his classic article (1957), Vendler showed that a cluster of linguistic properties distinguishes sentences of each situation type. There are characteristic patterns of co-occurrence with adverbials, aspectual viewpoints, and other forms. A given situation type is grammaticized in a language if the verb constellations that express it have a consistent, unique set of linguistic properties.

The situation type of a sentence is conveyed by the verb and its arguments, the verb constellation. The verb constellation conveys the concept of a situation, just as a noun, *apple* for instance, conveys the concept {apple}. Thus the verb constellation [Mary walk by the river] expresses the concept {Mary walk by the river}, and underlies the sentence *Mary walked by the river*. For simplicity, I shall say that a sentence expresses a situation type and temporal features; thus *Mary walked by the river* is an

Activity sentence, with the properties of dynamism, duration, atelicity. The discussion will focus on English for specificity; other languages are treated later.

Verb constellations are associated with a given situation type according to temporal features. Situations are neutrally presented as complete, functional wholes, by the general principles of basic-level categorization. The verb constellation [Mary walk by the river] is associated with the Accomplishment situation type because it denotes a Dynamic, Telic, Durative event. As we shall see, one can give evidence that a verb constellation is associated with certain semantic properties. The evidence comes from the linguistic characteristics of sentences of each situation type, presented in the following Chapter.

The relation between verb constellations and situation types is not one-to-one, however. Verb constellations may be associated with several situation types. This variation is due to the range of aspectual choice available to the speaker. Sentences may present a situation in its entirety, as in the perfective examples presented so far. They are other possibilities. Sentences may focus on the the beginning of a situation (inchoative Achievement), or another aspect; they may present an event as a sub-part of another (multiple-event Activity); as part of a pattern of situations (habitual Stative); as a class of situations (generic Stative). (1) illustrates with sentences in which verb constellations are associated with more than one situation type.

(1) a. Bill knew the truth. (Stative)
b. Suddenly Bill knew the truth. (Achievement)

a' Mary coughed. (Semelfactive)
b' Mary coughed for an hour. (Activity)

a'' Kim played a set of tennis on Friday. (Accomplishment)
b'' Kim always played a set of tennis on Friday. (Habitual Stative)

These sentences are not exotic; indeed, they are quite ordinary. There are other cases: speakers may also categorize a situation in an unusual manner. Often such marked presentations differ in situation type from the standard presentation.

In the light of these examples, it is clear that we cannot simply classify verb constellations as associated with particular situation types. It is necessary to include variation in the account. Note that the situation type categories themselves are not inadequate: no new categories have been uncovered. One possibility is multiple categorization. But such an approach would suggest that there is no difference between the several associations of a verb constellation with situation types, which seems incorrect. We have already seen that there is good reason to distinguish basic-level and derived categorization. I will use these notions to account for the range and variety of situation types.

In the pairs above, the (a) sentences represent basic-level categorization. The (b) sentences are derived-level, the result of situation type shifts. The basic level of categorization is always available for a verb constellation. The derived level requires adverbial or other information from context. Situation type shifts are triggered by

clashes of temporal features, and are predictable by rule. Derived situation types and a principle for shifts are discussed in Chapter 3.

2.2 Temporal Features of the Situation Types

The five idealized situation types classify situations by a defining cluster of conceptual temporal properties. Situations can be also categorized more globally as either states or events. A general temporal feature of boundedness turns out to be important at this level. I consider the global categories in 2.4 below.

The temporal properties of dynamism, telicity, and duration distinguish the basic situation types. Stated as semantic features, the properties form three contrasting pairs. The features can be expressed compactly with plus and minus values, but for perspicuity I will refer to opposing positive features. I discuss each pair briefly.

[Static / Dynamic]: The distinction between stasis and motion is fundamental, and bifurcates situation types into the classes of states and events: states are static, events are dynamic.

States are the simplest situation type. They consist of a single, undifferentiated period. Although states obtain in time they do not take time, in the happy phrase of Taylor (1977:206). The distinction between states and events is commonly reflected in language. Often different words are used to refer to states and events. In English an event *occurs, happens, takes place,* while a state *holds* or *obtains*. Linguistic correlates of the distinction vary among languages.

The natural class of events comprises all non-stative situations. Events are dynamic; they are "continually subject to a new input of energy," as Comrie puts it (1976:49). Events take place in time. They consist of successive stages which occur at different moments, and thus have the 'stage property'.

[Telic / Atelic]: Events may be telic or atelic. Telic events have a change of state which constitutes the outcome, or goal, of the event. When the goal is reached, a change of state occurs and the event is complete (Garey 1957: 106). The category of telic events includes events without agents. A rock falling to the ground from a cliff is a telic event: the final endpoint is reached when the rock is on the ground. To avoid agentive connotations I will say that telic events have a natural final endpoint, or intrinsic bound.

In contrast, atelic events are simply processes. They can stop at any time: there is no outcome. In other words, atelic events have arbitrary final endpoints. The feature of telicity is grammaticized in many languages. Of the five discussed in this book, English, French, Russian and Chinese distinguish telic and atelic events distributionally; Navajo has a different treatment of telicity.

[Durative / Instantaneous]: Situations are durative or instantaneous. This notion of instantaneous is conceptual, an idealization. An event such as [win the race] may take several milliseconds, strictly speaking, without marring its categorization as [Instantaneous]. For some scholars, duration is an inessential feature of situations (Mourelatos 1978, Dowty 1986). I include it here because of its linguistic salience. Duration is a linguistic category for all five languages discussed in this book.[3]

The clusters of features that distinguish the situation types are summarized below in binary terms.

(2) Temporal features of the situation types

Situations	Static	Durative	Telic
States	[+]	[+]	[-]
Activity	[-]	[+]	[-]
Accomplishment	[-]	[+]	[+]
Semelfactive	[-]	[-]	[-]
Achievement	[-]	[-]	[+]

Not all the possible combinations are realized: the feature [±Telic] is irrelevant to situations with the property [+Static].

There is a far-reaching structural analogy between the part-whole structure of events and things, as many scholars have noticed, among them Mourelatos 1978, Hoepelman & Rohrer 1980, Bach 1986. Countable things differ from uncountable, cumulative things in the relation of parts to whole (the terms are from Quine 1960: §19). For uncountable things a proper part counts as an instance of the whole. In contrast, for countable things a proper part is not an instance of the whole. To see this, consider *water* and *a glass of water*. *Water* is cumulative; *some of the water* in a pond is *water*. But *a glass of water* is a countable thing, and a proper part is not an instance of the whole: *some of the water in a glass* is quite different from *a glass of water*.

The same relations between part and whole hold for events of different types. Accomplishments correspond to countable things, Activities to cumulative things. Consider *John walked*, an Activity. A proper part is an instance of the whole: part of the walking is an event of walking in itself. Thus the imperfective *John was walking* entails that *John walked*. In contrast, Accomplishments are countable: a part is not an instance of the whole. We cannot conclude from *John was walking to school* that *John walked to school*.

Telic events are specific and countable. This property is expressed partly by the nominal arguments of a telic sentence, which must include a count noun. (3) illustrates:

(3) a. He played sonatas. (Activity: atelic)
b. He played a sonata. (Accomplishment: telic)

The entities referred to by the object NPs—bare plural in (3a), count noun in (3b)—make the difference between a telic and an atelic event.

An elegant formal analysis of the analogy between things and events is presented in Krifka 1987, 1989. Krifka proposes that a countable, quantized event or thing involves a path that traverses the entire internal structure, whereas cumulative events and things have no such internal structure and no such path. Krifka models the notion of path in a formal account which shows how nominals contribute to the verb constellation. The analogy between things and events is known as a 'mereological' one, because it involves the relations between part and whole (cf. Greek *meros*, part or fraction). The mereological relations are similar in both domains.

2.3 The Causal Chain

We would like an independent way of understanding the relation between verb constellations and situations. The notion of a 'causal chain' allows us to do this. The causal chain sets out the basic components of causal structure. With the chain, we are able to relate verb constellations of the five situation types to the causal structure of situations generally. The mapping of verb constellations to the causal chain allows us to consider its lexical nature, which I will call 'lexical span'. I will set out a scheme for the causal chain, and then discuss the typical lexical spans of different verb constellations.

Our understanding of events is based on the notion of causation. Humans commonly recognize in events a chain of circumstances. Among these cause is primary: indeed, Donald Davidson suggests that causal structure defines events (1973:114). Linguists have found it fruitful to use the notion of causation in representing the course of events. Other essential components are agent, instrument, and action.[4] I adopt here a scheme for representing events proposed by Croft (1987:1200), shown below. All components need not appear in a given event, nor in linguistic reference to it.

(4) Causal Chain

CAUSE SUBJECT ACTION INSTRUMENT OBJECT RESULT

The scheme is roughly iconic from left to right. The leftmost parts are earlier in time, and prior causally to the rightmost portion. Some elements are simultaneous: if an instrument is present, it is part of the action of an event. (Croft's scheme is slightly more complex.)

Using the causal chain, we can study the lexical spans of verb constellations. The 'lexical span' of a verb constellation indicates how much of the causal chain it covers. For instance, [arrive in Boston] has a short span at the end of a chain, whereas [go to Boston] covers a larger part of the chain, as in (5): dots represent lexical span:

(5) Lexicon spans of verb constellations

CAUSE SUBJECT ACTION INSTRUMENT OBJECT RESULT

a. go to Boston .....
b. arrive in Boston .....

The verb constellations are both telic: [go to Boston] is an Accomplishment, [arrive in Boston] an Achievement.

The lexical spans of these two examples are characteristic of Accomplishment and Achievement verb constellations. There are typical locations on the causal chains for each situation type. Activities and Semelfactives span the earlier part of the chain and do not have the stage of result. Accomplishments have the largest span, often including cause or agent, reflecting the complexity of this situation type concept (see 2.4.2). Some Achievements are at the rightmost end of the chain, others include earlier stages. Statives have a short span at the end of the chain. (6) illustrates:

(6) The Causal Chain and Situation Types: typical examples

CAUSE	SUBJECT	ACTION	INSTRUMENT	OBJECT	RESULT
Activity	- - - - - - -	laugh	- - - - - - - - - - - -		
Semelfactive	- - - - -	knock	at the door	- - - - - - -	
Accomplishment	- - - - - - - - - - - -	climb	a tree	- - - -	
Achievement		- - - - - - - -	cure	the patient	- - - -
State				- - -	know French

The verb constellations of a given situation type do not always conform to the span of typical cases, of course.

There is a causative classification, familiar to grammarians, which characterizes sentences by a mapping to the causal chain. 'Causative' sentences span the entire chain, including a cause, agent, and change of state. 'Inchoative' sentences present the coming about of a state, without the agent. 'Inceptives' span the entry into an event; 'Egressives' span the exit from an event. 'Resultatives' extend the lexical span of a verb constellation with a resultative complement. The categories are all telic. They are Accomplishments or Achievements, depending on duration of the change of state. There are other ramifications of the causal chain. Croft suggests that thematic roles correspond to roles in the causal chain. He also proposes a case hierarchy that follows the order of appearance in the chain.

The causal chain represents a primary way of categorizing events. The prototypical members of the event category have clear causal structure and an agent (Hopper & Thompson 1980). The idea applies naturally to the notion of situation types.[5]

Lexical semanticists have identified several types of causation which are expressed linguistically. For instance, Talmy (1985) discusses different causation types across languages, including autonomous events, resulting-event causation, causing-event causation, instrument causation, author causation with intended and unintended result; see also Gruber (1976).

2.4 The Situation Types

This section gives for each situation type a semantic characterization, the basic-level and derived cases, and sentences that realize the situation type. In the following Chapter the linguistic properties of the situation types are presented in detail.

I take it that the central, basic-level examplars of each situation type are simple, complete situations. The derived members focus part of a situation; or have a complex internal structure which consists of instances of another situation type; or represent a marked association of verb constellation and situation type.

Temporal schemata which give the distinguishing properties are associated with the situation types. The feature [Static] denotes an undifferentiated period; [Dynamic] denotes successive stages, as in (7a-b). The initial endpoints of events are natural, since they represent a change from a state of rest. The final endpoints are natural or arbitrary, as indicated by the subscripts of (7c-d):

(7) a. —— [+ Static] Undifferentiated period of states
b. . . . [+ Dynamic] Successive stages of events

c. I F_{Arb} Initial and arbitrary endpoints
d. I F_{Nat} Initial and natural endpoints

The third feature, Duration, is indicated by the presence or absence of internal stages in a temporal schema. These schemata are informal; formal statements are given in Chapter 7.

2.4.1 Activities

The Activity situation type

Activities are processes that involve physical or mental activity, and consist entirely in the process. They have the temporal features [Dynamic], [Atelic], [Durative]. Typical Activities are [stroll in the park], [laugh], [revolve], [think about], [enjoy], [eat cherries]. The temporal schema is given below:

Temporal schema of Activities: I . . . . . F_{Arb}

The termination of an Activity does not follow from the structure of the event. The arbitrary final endpoint of an Activity is a temporal bound, explicit or implicit. Activities *terminate* or *stop*, but they do not *finish*: the notion of completion is irrelevant to a process event.

Activities have the part-whole relation of cumulative events. "Activities go on in time in a homogenous way; any part of the process is of the same nature as the whole" (Vendler 1967:133). If John walked in the park for some interval, the subevent of his walking for a few minutes of the interval is also an instance of walking. The part-whole relation is realized in a characteristic pattern of entailment between the whole and the parts of an Activity:

(9) Entailment pattern for Activities
If an Activity event A holds at interval I, then the process associated with that event holds at all intervals of I, down to intervals too small to count as A.

The qualification of interval size is necessary because Activities cannot be said to take place at vanishingly small intervals. Waltzing, chuckling, running, for instance, require certain motions; at a small enough interval, a person may be lifting a foot but not running (Taylor 1977:212). But Activities are not entirely homogenous. The endpoints involve change to and from a state of rest.[6]

Activities may have explicit, independent, bounds, as when they appear with certain time adverbials (*from 2 to 3, for an hour*). The explicit bound has a transformative effect on the verb constellation, producing a sentence with telic properties. In other words, the situation type value of an Activity shifts in the presence of an explic-

it bounding adverbial. Independently bounded Activities have a specific final endpoint and the grammatical correlates of telicity. They are discussed further in 2.3.2, and in Chapter 3.

Activity situations

There are three main classes of Activities. One class consists of processes that are unlimited in principle, such as [sleep], [push a cart], [laugh]. Another class of Activities has indefinitely many internal stages, as in [eat cherries]. There are also derived, shifted Activities.

Activities may involve animate beings and events of movement, activity, and/or volition; weather processes such as raining, snowing; actions such as vibrate, rotate, hum; non-extensional actions such as seek, listen for, look for; physical perception (Dowty 1979).

Sentences with degree predicates may present Activity events, when they indicate the increase or decrease of a property (not an absolute presence or absence). The examples illustrate.

(10) a. They are widening the road.
b. They widened the road.

These sentences refer to situations of gradual change, and do not require that a particular degree be reached. After widening, the road may still not be very wide; the soup may not be quite cool after a period of cooling. Degree predicates such as these are known as 'vague' predicates in the philosophical literature; for a linguistically oriented discussion see Dowty 1979: 88-90. Abusch 1987 presents a semantic analysis of degree predicates in which a change takes place at each stage, but there is no natural final endpoint.

Multiple-event Activities are an important class of derived Activities. Their internal stages consist of sub-events, as in (11).

(11) a. We fed the puppy for an hour.
b. The wheel revolved for an hour.
c. Mary coughed for an hour.

(11a) presents a single event which consists of a series of feedings (Abusch 1986). Certain sub-events are cyclic. For instance, in (11b) each revolution is a complete cycle that is followed by termination or another cycle (Bull 1971:41). Others are iterations of Semelfactives, as in (11c). In the literature such events are often referred to as *iterative* or *repetitive*. Achievements also occur in derived Activities: *John found crabgrass in his yard all summer* (Dowty 1979).

Other derived Activities focus on the internal stages of situations, with certain main verbs and sentential complements. The verbs [continue], [keep on] belong to this class, as in *Mary continued to read the letter, John kept on walking to school.* These verbs are 'super- lexical' because they focus a particular aspect of a situation rather than specifying its content. See Chapter 3.

Activity sentences

Basic-level Activity sentences have verb constellations consisting of an atelic verb and compatible complements, or a telic verb with a a mass NP complement (e.g., the object in *eat cherries*). There is no limit or natural endpoint to such events.

The sentences with mass nouns may form complex predicates, in a sense incorporating the object into the verb , e.g. [write books], [repair shoes]. Some languages have productive processes of verb incorporation with syntactic consequences. In Japanese, after verb-incorporation the object is syntactically part of the verb (Grimshaw & Mester 1988). Marginal cases of verb incorporation can be seen in English nominals such as *book-writing*. Navajo has an indefinite verb form which signifies incorporation of the same type.[7]

Activity sentences that are complex rather than basic-level frequently have an adverbial with an aspectual value that differs from the verb constellation. See the discussion of temporal adverbials and shifted situation types in Chapter 3.

Most languages have forms that make a telic verb constellation atelic. In English certain prepositions (*in, away*) effect such a change. The verb constellations [read the book], [paint the fence] are telic, whereas [read in the book], [paint away at the fence] are atelic.

The entailment characteristic of Activities can be shown with sentences of different viewpoints. Imperfective sentences present part of an event, perfective sentences present an event as a whole. If an imperfective Activity sentence is true during interval I, the corresponding perfective sentence is true: (12a) entails (12b).

(12) a. The kitten was chasing its tail.
b. The kitten chased its tail.

This entailment holds because Activities are atelic and durative.

Inceptive sentences may in effect present an Activity indirectly. The inceptive focuses on the beginning of the event. The receiver may reasonably infer that the Activity continues, unless there is information to the contrary. The inceptive focus may be due to a super-lexical verb such as *begin*, or may be suggested by a punctual adverbial. Such adverbials are incompatible with durativity. The second type occurs quite often in narrative. The examples illustrate:

(13) a. Mary began to run.
b. Suddenly Mary ran. An hour later she was still running.

In both examples the verb constellations are Achievements which present a change of state into an Activity.

Sentences in the perfective viewpoint present Activities as implicitly bounded with arbitrary endpoints. Sentences in the imperfective present Activities, as ongoing and unbounded.

2.4.2 Accomplishments

The Accomplishment situation type

Accomplishments consist of a process and an outcome, or change of state. The change is the completion of the process; Accomplishments are finite, intrinsically bounded. They have the temporal features [Dynamic], [Telic], [Durative]. Typical examples are [build a bridge], [walk to school], [drink a glass of wine]. Accomplishments have successive stages in which the process advances to its natural final endpoint. They result in a new state.

When a process with a natural final endpoint reaches its outcome, the event is completed and cannot continue. If you have walked to school and arrived there, the event is complete: you cannot go on with it, although you may retrace your steps. If you write a sonnet, when you finish the final couplet the only possible next stage is revision. The notion of completion is essential: Accomplishments *finish*, or are *completed*, whereas Activities *stop* or *terminate*. (14) give the temporal schema of an Accomplishment:

(14) Temporal Schema of Accomplishments: I. . . . .F_{Nat} R

The result state of an Accomplishment may or may not continue.

The process component of an Accomplishment is essential to the very notion of the event. Consider the constellation *write a letter*, for instance. The actual writing cannot be omitted: if John brings a letter into being at the snap of a finger, one would not say that *John wrote a letter*. Again, one would not say that *Mary climbed a tree* if she were suddenly wafted to the top of a tree. The relation between the process and outcome of an Accomplishment is known as non-detachability (Dowty 1977, Vlach 1981). There is an entailment relation between process and outcome that is the formal correlate of the notion of non-detachability. If the outcome of an Accomplishment is reached, the process occurred. (15) states the entailment informally:

(15) Entailment pattern for Accomplishments
If event A occurs at interval I, then the process associated with A occurs during the internal stages of that interval.

But if from the occurrence of a process that is standardly associated with an outcome, one cannot infer the outcome.

Not all Accomplishments are completed. I may change my mind while drawing a circle and decide to draw an eggplant instead. Again, in the middle of crossing the street Mary may decide to stroll down the center; or she may be hit by a truck and never complete the crossing. Nevertheless one might reasonably judge in these cases that Accomplishments were in progress, and talk about them with the progressive viewpoint, e.g. *Mary was crossing the street*. In such cases the speaker makes a judgment about the kind of situation that is going on, including the intentions of participants. See the discussion of progressives in Chapter 4.

Since Accomplishments take time, they often cannot be perceived directly. One interprets different percepts, or stages, as constituting a single event. For example, I may see Mary approaching the sidewalk, in the middle of the street, and then at the other side of the street. I may refer to all these percepts with the verb constellation [cross the street]. In talking about an event as an Accomplishment, one makes a judgment about how events in the world are related.

Accomplishment situations

The change of state of an Accomplishment takes various forms but always "some state of affairs obtains over and above that which consists in the performance of the subservient task activity" (Ryle 1947:151). The new state of affairs may affect the object, as in [build a bridge], [cook a turkey]. The new state may affect the subject, as in [walk to school], [miss the bus]. Telic events may be classified by the type of result they bring about, as follows:

(16) Major types of Results
Affected object: [bend an iron bar], [wrinkle a dress], [break a pot]
Constructed object: [build a house], [write a letter]
Consumed object: [destroy a house], [drink a glass of wine]
Affected experiencer: [amuse Mary]
Path-Goal: [walk to the lake], [work from 2 to 3]

The notion of Path-Goal can be generalized to include transactions such as [buy] and [sell] (Jackendoff 1972, Gruber 1976).

This classification has some grammatical ramifications. The Chinese *ba* construction, for instance, requires that an object be affected (Chapter 11). Changes of state are also classified by type of process, with distinctions between contact, process-oriented, manner-of-motion predicates (Levin & Rappaport Hovav 1995).

Result constructions have complements that augment the telic verb constellation. They appear in many languages. The complement extends the lexical span with information about the resultant state of a telic event. Such complements appear as arguments or as verb affixes; the examples illustrate for English and Chinese.

(17) a. The sheriff shot the man dead.
b. The wind shaped the hills into cones.
c. Jiqi ya-duan-le tade shouzhi.
machine crush-sever-le heDE finger
The machine severed his finger

In (17c) *duan* (sever) is resultative: it augments the verb *ya* (crush).

Among derived Accomplishments are process sentences with independent, explicitly stated bounds. (18) illustrates:

(18) a. We strolled by the river for 2 hours.
b. Sam worked from 2 to 4 this morning.

Temporally bounded processes are like telic events in having specific, finite endpoints. But they are also unlike telic events, because there is no change of state. The difference is a conceptual one: we think of traversing time and space differently.

When one covers a certain amount of space, one arrives at a new location; but no such result is assumed for time. (19) illustrates:

(19) a. I walked to school.
b. I walked (for) 3 miles.
c. I walked for 3 hours.

The events of (19a-b) have result states; but that of (19c) does not. We do not conventionally think of changes of time as arrivals. When I arrive at a time three hours later than I began, the later time is not considered a resultant state. Thus temporally bounded events are distinct from telic events proper.

Sentences with atelic verb constellations and telic adverbials are also derived Accomplishments, as in *John swam laps in an hour*. One interprets such a sentence as telic: a particular amount of swimming took place during an hour.

Derived Accomplishments may have super-lexical verbs such as [begin], [start], [finish], which focus one endpoint of an event. The endpoints are changes of state with internal structure, as in (20).

(20) a. They gradually fell in love.
b. He slowly stopped walking.

The outcome is the change into a new state, or a durative event, or the change out of an event to a state of rest.

Accomplishment sentences
Because they include process and outcome, Accomplishment sentence are ambiguous with the adverb *almost*. There are two readings, in which *almost* pertains to the initial or the final endpoint; as in (21):

(21) John almost opened the door

On one reading, John didn't quite get to the door; on the second, he didn't quite get the door open. The difference can be represented semantically in terms of the scope of the adverbial. Temporally bounded Activity sentences are also ambiguous with *almost*:

(22) I almost walked for 3 hours.
...but I stopped after only 2 1/2 hours.
...but I decided not to because I had too much work to do.

This type of ambiguity appears only with sentences presenting durative, explicitly bounded events.

The entailment of Accomplishments can be shown with perfective and imperfective sentences. If an Accomplishment sentence with the perfective viewpoint is true at interval I, then the corresponding progressive sentence is true at interval I:

(23) a. John built a cabin last summer.
b. John was building a cabin last summer.

If (23a) is true then (23b) is true. The opposite entailment does not hold, of course. Although John was in the process of building a house, he may not finish building and never produce a house.

Accomplishments are finite events with a natural final endpoint. Accomplishment sentences must have a verb constellation with a countable argument. If the argument is countable, the event is finite, as in [John eat 3 apples] or [Mary build a bridge].

Indirect presentations of Accomplishments occur with inceptive sentences, which present entry into the process stages of an Accomplishment. Inceptives have explicit super-lexical verbs such as *begin* (24a), or there may be an implicit inceptive reading (24b).

(24) a. They began to walk to school.
b. They walked to school at noon.

Without information to the contrary, one tends to infer that the event proceeded as intended.

2.4.3 Semelfactives

The Semelfactive Situation Type
Semelfactives are single-stage events with no result or outcome.[8] They have the features Dynamic, Atelic, Instantaneous. Typical examples are [knock at the door], [hiccup], [flap a wing]. Semelfactives are the simplest type of event, consisting only in the occurrence. In the temporal schema, E indicates a single-stage event.

(25) Temporal Schema of Semelfactives: E

Since they are single-stage events, Semelfactives are intrinsically bounded. The term 'semelfactive' comes from the Latin *semel* (once), used in Slavic linguistics to refer to a suffix which indicates a single event; the term is sometimes used to refer to single events generally. I use it here for atelic instantaneous events. Navajo has a morphological category of traditionally known as 'semelfactive'; it is not semantically semelfactive since it includes durative events (Chapter12).

Single-stage events are conceptualized as instantaneous. They may involve a discernible period of time, but this does not disturb our notion of them. When a person coughs, or a bird flaps a wing, the events take some fraction of a second to occur. Nevertheless one thinks of them as instantaneous; and they have a set of grammatical features which contrast with those associated with duration. These remarks hold for Achievements as well.

Semelfactive situations
Typical Semelfactives are events that occur very quickly, with no outcome or result other the occurrence of the event. They include bodily events such as [blink],

[cough]; internal events, so to speak, such as [the light flicker]; and actions such as [tap], [peck], [scratch], [kick], [hammer a nail(once)], [pound on the table (once)].

These events often occur in repetitive sequences, rather than as single-stage events. Such sequences are multiple-event Activities. The multiple-event reading is triggered by an adverbial or other information, as in *Mary knocked for five minutes*. However, in many instances the multiple event seems to be just as basic as the single-stage event. Blinking, coughing, knocking, tend to occur in sequences, though they can of course happen as single events.

Semelfactive sentences

Semelfactive verb constellations are limited in distribution: they do not appear as such in sentences with the imperfective viewpoint, with durative adverbials, or other expressions of duration. This is what we would expect, considering the temporal schema of the Semelfactive.

However, the sentences which have Semelfactive verb constellations and durative features are not ungrammatical. They are interpreted as multiple-event Activities: *Mary coughed for an hour, Mary was coughing*. The derived interpretation is triggered by the clashing temporal features of the verb constellation and other forms.

2.4.4 *Achievements*

The Achievement situation type

Achievements are instantaneous events that result in a change of state. They have the properties Dynamic, Telic, Instantaneous. Typical examples are [leave the house], [reach the top], [recognize Aunt Jane]. Preliminary or resultant stages may be associated with the event, but they are not considered part of it. The temporal schema of an Achievement consists of a single stage, a change of state:

(26) Temporal Schema of Achievements: . . . E_R . . .

The dots indicate preliminary and resultant stages, because they are included in the concept of an Achievement for many languages. The preliminary or resultant stages of Achievements are presented in sentences of a number of languages, as shown in Chapter 4.

The concept of an Achievement is a single-state event, detached from any associated process. This is true although many Achievements have a preliminary processes associated with them. In such cases there is no whole-part entailment. An Achievement sentence is true only for the moment of the event. If *Mary won the race* is true for time T, it doesn't follow that *Mary was winning the race* is true at that moment. Indeed, if *Mary was winning the race* is true at some moment, it would be a moment earlier than T.

Achievement situations

Typical Achievements are changes of state that occur very quickly, such as [find], [recognize], [break a glass]. The lexical span may focus on the outcome of a chain of events, as [reach the top], [arrive]; or the event may be instantaneous, as [find], [lose]. The result states of Achievements are like those of Accomplishments, as listed below.

(27) Major Types of Results for Achievements
Affected object: [break a cup], [tear a paper]
Constructed object: [imagine a city], [define a parameter]
Consumed object: [explode a bomb]
Affected experiencer: [see a comet]
Path-Goal: [reach the top], [arrive in Boston]

Many Achievements allow or require preliminary stages. They may be conventionally necessary, as in [win a race]: to win a running race one must run it. Again, [reach the top] requires a preliminary approach. If a magician whisked Mary to the top of a pyramid, we would not say that she had reached the top.

Other Achievements have preliminaries in some cases, but not others. For instance [I recognize John] may occur with preliminaries: I may meet John at a party and gradually find him familiar, eventually recognizing him as an acquaintance of years ago. But I may also recognize John instantly. Similarly, [find your watch] may occur after some preliminary searching stages, or without them. Although preliminaries of different types are related to Achievements, they are conceptually detached from the events.

Achievement sentences

Agent-oriented adverbs are sometime odd with Achievements, as Ryle noted for examples like those of (28):

(28) a. John deliberately found his watch.
b. Abigail deliberately hit the target.

The oddity of these sentences seems mysterious. Achievements are typically controlled by an agent and therefore should be compatible with the adverbial *deliberately*. But the sentences are less odd when one thinks about the nature of the particular events they present. Neither finding nor hitting the target can be completely controlled by an agent (Ryle 1947:149). You can look for your lost watch, and you may find it; but you can't control the finding. Ryle called these "purely lucky" Achievements. I suggest that the adverbials are odd in these cases because the events do not allow control. However, the temporal structure of Achievements is not incompatible with control.

If this is correct, we should be able to find Achievement sentences that allow agent-oriented adverbials. There are such examples. They may deny control (29a-b), or present plausible cases of control (29c-d). For these examples assume that John is a good shot.

(29) a. John accidentally lost his watch.
b. Mary accidentally hit the target.
c. John deliberately missed the target.
d. John deliberately hit the new window.

Evidently, the factor of control is orthogonal to temporal structure. Some Achievements allow agent-oriented adverbials, others do not. Although Ryle's observations are certainly correct, he did not consider a sufficiently wide range of data.

Derived Achievement sentences appear with super-lexical verbs such as *start* and *finish*. They focus on an instantaneous initial or final endpoint, e.g. *Mary started / finished reading the book*. Many inchoatives are of this type, including those referring to events of cognition, where the event results in a state, e.g. [know the answer].

2.4.5 *Statives*

The Stative situation type

States are stable situations which hold for a moment or an interval. They have the temporal features [Static], [Durative]. I shall use the term Stative to refer to members of the situation type. Typical statives include [own the farm], [be in Copenhagen], [be tall], [believe in ghosts]. The property of duration holds for statives, even the most temporary. To see this, consider a state of minimally short duration, as in *The temperature was ninety and rising* (the example is due to Barbara Partee). For the sentence to be true, there must be a change into the state S, when the temperature is 90); a minimal period during which S obtains; and the change out of the state S.

States consist of an undifferentiated period without internal structure. They have no dynamics, and require external agency for change. The initial and final endpoints of a state are not part of the state: they are distinct situations, constituting changes of state.

The temporal schema consists of an undifferentiated period:

(30) Temporal schema of states: (I) —— (F)

The endpoints, given in parentheses, are not part of the state.

This temporal schema reflects the intuition that states do not "take time." When a state holds for a certain period of time, the whole schema is true every moment. In contrast, particular stages of an event hold at particular moments in time. When John owns a horse for a week, or Mary knows French, there is no moment throughout the week during which these states do not hold in just the same way as every other. This property is reflected in an entailment that is characteristic of states, given informally in (31):

(31) Entailment pattern for states: When a state holds for an interval it holds for every sub-interval of that interval.

In model-theoretic semantics the property of holding consistently throughout an interval is formalized as the sub-interval property. Situations with the sub-interval property hold for all sub-intervals of an interval. States have the subinterval property.[9]

Stative situations

Statives include the ascription of concrete and abstract properties of all kinds, possession, location, belief and other mental states, dispositions, habits, etc. I cannot give a full compendium here, but will limit the discussion to distinctions of aspectual interest.

Private predicates such as [believe that S], [hope that S], [fear S], [know that S] are stative. It may seem that we cannot classify internal situations, since they are unobservable. Yet although the inner life is not available to inspection, people have clear and consistent intuitions about it. In classifying private predicates, people generally agree: [think that] is Stative, [think about] is dynamic, an Activity.

There is an interesting difference among stative predicates, according to whether they hold of individuals or of stages of individuals, due to Carlson (1977). Carlson argues that predicates which denote relatively stable properties, such as [be extinct], [be a beaver], hold of individuals and are 'individual-level' predicates. Predicates such as [be available], [be angry], denote transitory properties. They are 'stage-level' predicates. The distinction has many ramifications in syntax and symantics (Kratzer 1989); it also affects aspectual matters. In Chinese, for instance, there is an imperfective viewpoint (*-zhe*) which requires stage-level predicates (Chapter 11).

Verb constellations of posture and location (verbs such as *sit, stand, lie, crouch)* have special properties in many languages. In English these verbs are unique in allowing the progressive viewpoint with a static, resultative interpretation, as in (32).

(32) a. Steve is sitting on the chair.
b. The picture is hanging on the wall.

The sentences focus a static interval after the change of state denoted by the verb constellations. (This is unusual: standardly the progressive has a dynamic interpretation.) Verbs of posture and location can often appear in both stative and event sentences. As statives they present a position or posture, the result of a change of state; as non-statives the focus is earlier on the causal chain, the change of state.

Derived statives include sentences of generic predication. They hold of classes or kinds, and are thus individual-level predicates. Generic sentences ascribe a property to a class or kind, as in (33):

(33) a. Tigers are striped.
b. Tigers eat meat.
c. Dinosaurs are extinct.
d. Herbivores are common.

Generic sentences vary widely in syntactic properties. There are certain predicates, such as *extinct,* which hold only of kinds; but most predicates may be used both for individuals and for classes. Generics are discusssed in Carlson and Pelletier 1995.

The verb constellations of generic sentences are usually associated with dynamic situation types at the basic level of classification. For instance, *The beaver builds dams* has a generic reading, though the verb constellation is Accomplishment. On the generic reading *the beaver* refers to the class of beavers. The sentence can be taken as dynamic if *the beaver* refers to a particular beaver. Ambiguity of this type occurs often in generic sentences.

Habitual sentences are another type of derived stative. Habitual predicates present a pattern of events, rather than a specific situation, and denote a state that holds consistently over an interval.

(34) a. My cat eats mice frequently.
b. My cat ate a mouse every day.
c. Fiona was often in love.
d. Fred frequently walked to school.

To see that habitual sentences are semantically stative, it is interesting to consider their truth conditions. Investigating the truth of an habitual, one asks whether there is a pattern which holds over an interval, not whether a particular situation occurred. The temporal schema holds for the interval, as is typical of statives.

There is one construction in which the habitual interpretation is obligatory. English event sentences with the present tense and perfective viewpoint must be taken as habitual, with or without frequency adverbials. They contrast with stative sentences of the same tense and viewpoint, which are taken as specific. The examples illustrate; (35a) is stative, (35b-c) are non-stative.

(35) a. Susan is happy.
b. Mary feeds the cat.
c. Fred plays tennis.

(35a) denotes a particular state; (35b-c) denotes a pattern of events but no particular event. These sentences must be taken as habitual unless they have the special telescoped, dramatic reading known as the reportive, or the sports announcer present. The stative, habitual reading arises because the present tense is incompatible with an event presented perfectively; see 5.3.3 for discussion. Similar interpretations are required in other languages.

Habituals depend on a pattern of occurrence. The actual conditions that license a frequency adverbial depend on the situation. *Fido regularly chases cats* may be true if chasing events happen every so often; *Fred regularly plays tennis* may require a different frequency. The requirement of actual frequency differentiates habituals from another type of derived stative, the 'dispositional' sentence. Dispositional sentences denote ability or preference but not actual events. For instance, *Dwight plays bridge* could be uttered truthfully whether or not bridge-playing had taken place. Dispositional statements can be paraphrased with modals or explicitly dispositional main verbs e.g. *Dwight can play bridge, Dwight likes to play bridge*. Habituals have no such paraphrase.

Stative sentences

Languages differ in whether statives appear with some or all aspectual viewpoints. In English, the progressive viewpoint is not generally available for statives; all French viewpoints are available for statives and non-statives; Chinese statives appear with only one of several viewpoints in the system. Thse matters are discused in Chapter 4.

In the direct presentation of a state, the verb constellation focuses lexically on that state, e.g. *Mary is tall*. States can also be presented indirectly, through a change of state (inchoative). Inchoatives often allow the inference that the resultant state continues, unless there is information to the contrary. For instance:

(36) a. Mary got angry.
b. John became tired.
c. Bill learned Greek.
d. The gate was closed by the guard.

Many languages have inchoative verbs (*get, become*) or verb affixes. In English the main inchoative forms are the suffix *-en* and a zero variant, as in *Her face whitened, The page yellowed.*

Habitual sentences standardly have frequency adverbials. In the context of a frequency adverbial almost all verb constellations can be taken as habitual. For instance, *Every afternoon John ate an apple* has an individual nominals and a quantized object, yet it is clearly habitual. Certain deictic forms are exceptional (Smith 1983).

The habitual interpretation often arises in sentences that do not have a frequency adverbial. Thus it is natural to take (37) as habitual.

(37) Eva got up at noon last summer.

There is a disparity between the interval given by the adverbial and the time required for a single instance of the event. Moreover, getting up normally occurs every day. The habitual interpretation depends both on information in the sentence, and on world knowledge.

In some languages habituals are signaled morphologically. Navajo has an habitual morpheme; it contrasts in distribution with the perfective and imperfective viewpoints. French typically uses the imperfective viewpoint for habitual sentences.

2.5 The General Categories of Event and State

Globally, the classes of states and events have two important differences: mereological structure, or relations between part and whole; and the property of dynamism. I discuss each in turn.

Events are discrete, bounded entities. This property is realized in the temporal schema of events. Instantaneous events consist of a single point. Durative events have an initial and a final endpoint. The initial endpoint is a change from a state of rest; the final endpoint is a change into a state of rest, whether the event is telic or atelic. All durative events are heterogenous, in a sense. They do not have an entirely uniform mereological structure because their endpoints are distinct in kind from their internal stages (note 6).

In the discussion above I have established that the event types have intrinsic, independent, or implicit bounds. Telic events are intrinsically bounded because their final endpoints constitute changes of state. Semelfactives are bounded by the single-stage nature of the event. Temporally bounded Activities have independent bounds. Activity sentences have an implicit bound in sentences with the perfective viewpoint. Because of the implicit bound they constitute discrete events, as I argue in Smith 1996. This is a somewhat controversial analysis of Activities; see Herweg 1991 for a

different view. (Events are realized in sentences; only perfective viewpoint sentences are relevant here).

In contrast, states are cumulative and unbounded. They have a uniform part structure, as shown by the fact that the sub-interval property holds of them. The global class of stative sentences includes all sentences with the imperfective viewpoint. Such sentences have the sub-interval property; see the discussion in Chapter 4.

Events and states also differ in *energeia*, or dynamism. Events require energy; they occur in successive stages which are located at different moments. The successive stages of events are represented by the stage property (see p 19). But States consist of an undifferentiated period, and continue unless something happens to change them.

The bounded nature of events can be derived from their dynamism. Events require a constant input of energy. In the world as we know it, energy must have a source; as energy begins and ceases, so will an event. Therefore, dynamism implies that events have an initial endpoint and an eventual final endpoint. The approach is close to ideas in naïve physics, as Manfred Krifka has pointed out to me. Research in naïve physics, or commonsense knowledge, shows that energy is an essential factor in human perception and categorization.[10]

The property of boundedness thus has sources in both the mereological and dynamic properties of events. Both imply that an event has initial and final endpoints. For another view of the distinction between states and events see Herweg 1991.[11]

The classification of situation types can be amended to reflect these distinctions in boundedness. Instead of the feature telic/atelic, the general feature [Bounded] might be used. There would be three values for this feature. Bounded situations have [Intrinsic], [Implicit] or [Independent] bounds.

The distinction between bounded and unbounded situations is important for the temporal structure of narrative texts. In aspectually oriented work on narrative, Kamp & Rohrer 1983 show that bounded events move narrative time, whereas unbounded events do not. The contribution of aspectual information to discourse can be represented in the structures of Discourse Representation Theory.

Notes

[1] The modern study of situation types begins with Ryle (1947) and Vendler (1957). See also Taylor 1977, Mourelatos 1978, Dowty 1979, Smith 1983.

[2] Aristotle's distinction between static and dynamic is discussed decisively by Graham 1980, and summarized in Mourelatos 1993.

The property of telicity was introduced in Garey 1957, Vendler 1957, Kenny 1963.

[3] Mittwoch 1979 presents strong evidence for a grammaticized feature of durativity in English; Cochrane 1977 does the same for Russian. The grammatical differences between durative and instantaneous events are striking in Navajo (Chapter 12).

[4] Agency is a complex concept (Dowty 1991). Causation and volition are related to agency; the notions are grammatically independent in some languages.

[5] See Dowty 1979, Foley & van Valin 1984 for an interesting account of causation and situation type. Dowty proposes an "aspect calculus" which builds causation and agency into the notion of situation type. In his approach Achievements are inchoative and Accomplishments have an additional causative element.

[6] Recognizing that endpoints are a special status, Parsons notes that the typical entailment from part to whole of Activities may not hold if the Activity has just started. He comments that "eventualities picked out by process verbs (e.g. Activities, CSS) are homogenous in some sense needing articulation" (1990:38). I thank Richard Meier for helpful discussions of this point.

[7] Navajo verbs have subject and object pronominals which are coindexed with independent nominals in a sentence. There is an indefinite pronominal which conveys that an activity involves an objects. The examples illustrate: (ii) has the indefinite pronominal.

(i) dibé nanishkaad
Sheep I am herding them

(ii) na'nishkaad
I am doing the (sheep) herding

(ii) is not compatible with a nominal: the object must be unspecified.

[8] The events classified here as Semelfactive are treated as a special atelic subclass of Achievements by Vendler (1957) and Dowty (1979).

[9] The sub-interval property is often taken as the defining property of stative situations and sentences (Partee 1984, Herweg 1991).

[10] The field of naïve physics collects experimental data that is relevant to the distinctions discussed here. There is experimental evidence that infants have a cognitive correlate of energy, as manifested by mechanical forces in the world (Leslie 1994). Indeed, infants apparently use from early on a principle which Gelman characterizes as 'Attend to the source of energy.' This enables them to differentiate between objects with internal sources of energy from those that are made to move by something else (Gelman 1990). This notion of energy in this sense is close to dynamism as set out here. Not surprisingly, it is reflected in people's concepts and their realization in language.

[11] Herweg, among others, claims that the global categories of events and states can be adequately defined on mereological grounds, by the sub-interval property. He claims that Activities are unbounded, and have the sub-interval property.

CHAPTER 3

THE LINGUISTIC REALIZATION OF THE SITUATION TYPES

In this chapter I consider the situation types from a linguistic point of view. Section 1 sets out the syntactic and semantic properties that realize the temporal features of situation types. The properties are then assembled to characterize sentences of each situation type. Section 2 discusses the main types of derived-level situation types and proposes a general principle for them. Section 3 presents compositional rules for basic-level verb constellations and formalizes the principle for derived-level verb constellations as a compositional rule. I conclude with a short discussion of some interesting verb constellations.

3.1 Syntactic and Semantic Properties

The temporal characteristics of a sentence are directly related to its temporal features and situation type. They constitute distinct patterns of form and interpretation. Due to these patterns, the situation types have the status of covert linguistic categories. The syntactic and semantic properties are the key to investigating and/or demonstrating the situation type of a sentence.

3.1.1 Linguistic properties of the temporal features

In this section I present the linguistic correlates of the temporal features of dynamism, duration, and telicity. They include completion and detachability. Completion is the feature that distinguishes telic from atelic events; detachability holds for Accomplishments but not for Achievements. The discussion focuses on the positive values of the features and contrasts them with their opposites (e.g. dynamic-static, duration-instantaneous). I now discuss the temporal features in some detail. The examples are English, with typical verb constellations for each situation type. Language-particular variations will be considered in the Chapters of Part II.

Dynamism: Dynamism has linguistic correlates of two kinds. One set of correlates

relates to the semantic feature of agency: dynamic events may have agents, which are sources of energy and volition. States do not have agents, at least not directly. Reflecting this, linguistic forms which are associated with agency occur with event verb constellations but not with statives (Lee 1971, Ross 1972).

Imperative sentences, and complements of verbs like *persuade, command*, require non-stative verb constellations. They are associated with agency because only an event that is controllable can be commanded or persuaded.[1] I use # for semantically ill-formed sentences, and * for syntactically ill-formed sentences; some are on the borderline between the two. The constructions appear with stative and non-stative verb constellations in (1):

(1) a. Wash your car! (Accomplishment)
b. #Know Greek! (State)

a' I persuaded Mary to wash her car.
b' #I persuaded Mary to know Greek.

Also related to agency are adverbs of manner and instrument. They are compatible with events only, as we would expect. The examples present adverbs of manner such as *carefully, attentively,* and instrumental adverbials, in event and stative sentences.

(2) a. John carefully washed his car. (Accomplishment)
b. *John carefully knew Greek. (State)
c. Mary opened the door with a key. (Accomplishment)
d. The door was opened with a key. (Accomplishment)
e. *The door was open with a key. (Stative)

Event sentences are good with such adverbials, but statives are not. The contrast between (2c-e) is telling: the form *opened* is a participle, closely associated with events and allowing an instrumental adverb. But *open* is an adjective and is ungrammatical with an instrumental. These correlates of agency are semantically based and hold quite generally across languages.

There are language-specific grammatical correlates of dynamism as well. In English event verb constellations appear neutrally with the imperfective (progressive) viewpoint, but statives do not. Further, the pro-verb *do* in the pseudo-cleft construction is associated with agency and control, and requires a non-stative, as (3c-d) shows:

(3) a John was washing the car. (Accomplishment)
b *Kim was knowing the answer. (Stative)
c What John did was wash the car. (Accomplishment)
d #What John did was know Greek. (Stative)

Appearing in other constructions *do* is a general pro-verb. In the sentence *John knows Greek and Mary does too*, for instance, *do* is a pro-verb for stative *know*. Languages differ on these points. In French, for instance, stative sentences appear with the imperfective, but not with the pro-verb *faire*(do).

Another correlate of dynamism is the habitual interpretation of certain event sentences, noted above. Event verb constellations are taken as habitual in sentences with present tense and the perfective viewpoint. Statives present a particular state. (4) illustrates.

(4) a. Mary swims in the ocean. (Activity)
b. Ellen believes in ghosts. (State)

(4a) must be interpreted as habitual; the verb constellation denotes a basic-level Activity. (4b) has the standard, basic-level interpretation.

Together, these syntactic and semantic properties distinguish sentences with the temporal feature of dynamism. They constitute dynamic syntax. Sentences with the feature Static contrast as indicated above.

Duration: The temporal feature of Duration has adverbial and verbal correlates of several kinds. They hold across languages since they are semantically based, though not all language grammatize the same contrasts.

Durative situations are compatible with direct durative adverbials such as *for an hour, in an hour*, as (5) illustrates.

(5) a. Mary walked in the park for an hour. (Activity)
b. Mary built the sandcastle in an hour. (Accomplishment)
c. Mary was sick for a week. (Stative)

The adverbials give the duration of the situations (*for* and *in* adverbials are differentiated below). Now consider the sentences of (6), which present Instantaneous events with the same adverbials. (6a) is ill-formed; in (6b-c) the adverbials do not indicate simple event duration, but have other interpretations.

(6) a. #The bomb exploded for an hour.
b. The bomb exploded in an hour.
c. He coughed for an hour.

In (6b), the adverbial is interpreted as ingressive: it pertains to an interval before the event takes place. In (6c), the adverbial triggers a shift to a durative interpretation of the verb constellation. Thus *in-* and *for-* adverbials are interpreted differently for verb constellations of events that are semantically durative and instantaneous.

Duratives are compatible with inceptive and terminative morphemes, which imply that a situation has duration. Sentences of instantaneous situations are either ungrammatical with these morphemes, or have different interpretations. (7-8) illustrates.

(7) a. Mary began to build the sandcastle. (Durative)
b. Mary stopped building the sandcastle. "
c. Mary finished building the sandcastle. "

(8) a. ? The bomb started to explode. (Instantaneous)
b. ?? The balloon started to burst. "
c. #The bomb stopped exploding. "
b. #The bomb finished exploding. "

The inceptive sentences are more or less well-formed according to whether the event can be seen as having preliminary stages. (8a) is slightly better than (8b) because of the possibility that the fuse of the bomb was sputtering, presumably just prior to the expected explosion. The terminative sentences are simply ill-formed (ignoring slow-motion presentations in which no events are instantaneous).

With momentary adverbials (*at noon, at 5 o'clock exactly*, etc.), durative verb constellations have an inceptive interpretation. The adverbs have a direct interpretation with instantaneous constellations:

(9) a. They ate dinner at noon. (Durative)
b. The clock struck at noon. (Instantaneous)

Durative verb constellations allow indirect durative adverbials, which imply duration (*slowly, quickly*). These adverbials are incompatible with instantaneous events, as (10) shows:

(10) a. The door opened slowly. (Durative)
b. #The balloon burst slowly. (Instantaneous)
c. ?# The bomb exploded slowly. "

Some speakers allow sentences like (10c) on the ingressive reading, in which the sentence presents preliminary stages of an explosion.

Imperfective viewpoints focus internal stages of durative situations, preliminary stages of instantaneous telic events, as in (11):

(11) a. The door was opening. (Durative)
b. Mary was reaching the top. (Instantaneous)

Both sentences are well-formed, but the interpretations differ. Not all languages allow the imperfective viewpoint to focus preliminary stages of instantaneous events: in Mandarin Chinese, sentences like (10b) are ungrammatical.

These syntactic and semantic properties distinguish sentences with the temporal feature of Duration. Sentences with the Instantaneous feature have contrasting properties, as indicated above.

Telicity: Change of state, one of the most significant conceptual properties of events for human beings, is not expressed directly in language. There seem to be no linguistic correlates of change of state *per se*. The syntactic evidence for a telic event turns on the notion of completion, which involves the interaction of duration and change of state. The indirect syntactic approach to change of state is without question one of the

main contributions of Vendler and others working along the same lines. Formal semantic accounts of change of state build on von Wright's "logic of change" (1963:28).

The grammatical correlates of telicity involve the notion of completion. Verbs and adverbials of completion (*finish, in an hour*) contrast with verbs of termination and adverbials of simple duration (*stop, for an hour*). Telic verb constellations are compatible with completion; with forms of simple duration they are odd, or require a marked interpretation. In contrast, atelic verb constellations are odd with forms of completion, as (12) shows:

(12) a. Mary walked to school in an hour. (telic)
b. Mary finished walking to school. "
c. ?Mary walked in the park in an hour. (atelic)
d. ?Mary finished walking in the park. "

With adverbs of simple duration the situation is reversed. Atelic verb constellations allow them but they are odd with telic constellations. The verb *stop* is good with telic verb constellations, but does not indicate completion. (13) illustrates:

(13) a. ?Mary walked to school for an hour. (telic)
b. Mary stopped walking to school. "
c. Mary walked in the park for an hour. (atelic)
d. Mary stopped walking in the park. "

These contrasts are semantically based: the notion of completion is intrinsic to a telic event, irrelevant to an atelic event. Telicity is also relevant to the main verbs of time *take* and *spend*, when they have sentential complements. *Take* is compatible with telic verb constellations, *spend* with atelic verb constellations:

(14) a. It took me an hour to write the letter. (telic)
b. ?It took me an hour to listen to music. (atelic)
d. ?I spent an hour writing the letter.
c. I spent an hour listening to music.

(14d) suggests that the letter was not finished.

Similar contrasts are found in French, Italian, Spanish, and Russian, among other languages. But they do not occur in all languages. Neither Mandarin Chinese nor Navajo, for instance, has verbal or adverbial forms of completion that contrast with simple duration. Mandarin marks the distinction between telic and atelic verb constellations with verb suffixes known as Resultative Complements.

Non-detachability. The property of non-detachability relates the process part of an event to its outcome. The property distinguishes Accomplishments from Achievements.

The test with *almost*: As noted above, Accomplishments have two interpretations with the adverb *almost*. In contrast, other event types have only one. Consider these examples:

(15) a. John almost closed the door. (Accomplishment)
b. John almost laughed. (Activity)
c. John almost coughed. (Semelfactive)
d. John almost won the race. (Achievement)

(15a) has two interpretations, or possible scopes for the adverbial: the scope may be the entire event, or its culmination.

The interpretation of completive adverbials (*in an hour*) varies, depending on whether an event has a detachable or a non-detachable process. When the process is not detachable from the outcome, the adverbial holds for the entire event. For events with detachable processes the adverbial is ingressive, giving an interval which ends with the instantaneous event. (16) illustrates:

(16) a. We built the sandcastle in an hour. (Accomplishment)
b. He left in an hour. (Achievement)

In (16a), the adverbial is coterminous with the event; in (16b) the event occurs at the end of the interval presented by the adverbial.

The semantic and syntactic properties associated with temporal features must be determined for particular languages. I discuss them in Part II for the languages other than English.

3.1.2 Linguistic characterizations of the situation types

Sentences of the five situation types have a cluster of linguistic properties associated with their temporal features. I now present the characteristic distributional and semantic properties of each situation type.

Activities: Activities are Dynamic and have the properties of that feature. Verb constellations of Activities appear with imperatives, as complements of verbs like *persuade* (17a), and with volitional and instrumental adverbs (17b). Activities appear with the imperfective viewpoint (17c) and in the pseudo-cleft construction (17d). They have an habitual interpretation in perfective present tense sentences (17e).

(17) a. We persuaded Emily to push the cart.
b. Emily voluntarily pushed the cart.
c. Emily was pushing the cart.
d. What Emily did was push the cart.
e. Emily pushes the cart.

Activities are Durative. Progressive (imperfective) sentences present internal stages of the event, as in (17d above). Activity verb constellations are compatible with forms of simple duration (18a-d); with punctual adverbials they have an inceptive interpretation (18e):

(18) a. He pushed the cart for an hour.
b. He began/stopped pushing the cart.
c. He spent an hour pushing the cart.
d. He slowly pushed the cart.
e. He pushed the cart at noon.

Activities have the feature Atelic and are compatible with forms of termination, incompatible with forms of completion. Adverbials with *in* have an ingressive interpretation (19a); verbs of completion are odd (19b-c).

(19) a. They pushed the cart in an hour.
b. ?They finished pushing the cart.
c. ?It took them an hour to push the cart.

Sentences like (19b-c) can be interpreted as derived Accomplishments.

This cluster of properties is characteristic of Activities; they can be used to demonstrate that a sentence denotes an Activity.

Accomplishments: Accomplishments are Dynamic. The verb constellations appear in imperatives, as complements of verbs like *persuade* (20a),with volitional and instrumental adverbs (20b). They allow the progressive (20c), and the pseudo-cleft construction. They are taken as habitual in present perfective sentences (20d).

(20) a. We persuaded Sam to open the door.
b. Sam opened the door with a key.
c. Sam was opening the door.
d. Sam opens the door.

Accomplishments are Durative and Telic and have properties asssociated with this combination of features. Progressive sentences present internal stages, as in (20c) above. Accomplishment verb constellations appear with indirect adverbs of duration (21a), inceptives and egressives (21b), and forms of completion (21c-d). Punctual adverbials have an inceptive interpretation (21e); adverbs of simple duration are odd (21f).

(21) a. Sam slowly walked to school.
b. Sam began/stopped walking to school.
c. Sam finished repairing the bicycle.
d. It took Sam an hour to repair the bicycle.
e. Sam walked to school at noon.
f. ?Sam walked to school for an hour.
g. We painted the house purple for an hour.

Sentences like (21f) can be interpreted as derived Activities, in which there is no intention of reaching the goal. Note that adverbs of simple duration are compatible with Accomplishments when they pertain to the result state rather than the event itself, as in (21g).

Accomplishments involve a non-detachable process and outcome. They are ambiguous with the adverb *almost*, as noted above.

Semelfactives: Semelfactives are Dynamic and have the associated properties. They appear in imperatives (22a), as complement of *persuade* (22b), with volitional and instrumental adverbs (22c); in pseudo-cleft sentences (22d); in present perfective sentences they have an habitual interpretation (22e).

(22) a. Tap his shoulder!
b. I persuaded Mary to tap his shoulder.
c. She carefully tapped his shoulder.
d. What Mary did was tap his shouder.
e. Mary taps his shoulder.

Because of their other properties, Semelfactive verb constellations do not appear in basic-level sentences with the progressive viewpoint, as noted above: the progressive triggers a multiple-event interpretation.

Semelfactives are Instantaneous and Atelic. They are good with punctual adverbs (23a); with adverbs of indirect duration and completion, and inceptives, they have an ingressive interpretation (23b-c); with other forms related to duration they require a shifted interpretation as multiple events (23 d-e).

(23) a. She tapped his shoulder at noon.
b. She tapped his shoulder in an hour. (ingressive)
c. She slowly tapped his shoulder. "
d. She began/stopped tapping his shoulder. (multiple-event)
e. ?She finished tapping his shoulder. "

Achievements: Achievements are Dynamic, and verb constellations of this type appear in imperatives, as complements of verbs like *persuade* (24a), with instrumental and volitional adverbs (24b). They allow the imperfective viewpoint (24c) and the pseudo-cleft construction (24d); in present perfective sentences they have an habitual interpretation (24e).

(24) a. The other children persuaded Mary to break the glass.
b. Mary deliberately broke the glass.
c. He was winning the race.
d. What he did was win the race.
e. He wins the race.

Achievements like (24e) are also likely to have a telescoped, sports-announcer interpretation.

Achievements are Instantaneous and Telic. Progressive sentences present preliminary stages of the event (24d) above. Achievements are good with punctual adverbials (25a). They have an ingressive interpretation with some forms of completion (25b-c), and inceptives (25d). They disallow terminatives and simple duratives (26):

(25) a. John left at noon.
b. John left in an hour.
c. John began to leave.
d. It took John an hour to leave.

(26) a. #John slowly broke the glass.
b. #John finished breaking the glass.
c. #John broke the glass for an hour.
d. John borrowed the book for an hour.

Adverbs of simple duration are compatible with Achievements when they pertain to the result state rather than the event itself, as in (26d).

Achievements may involve a process, but if they do the process is detachable from the event itself. Thus Achievement sentences are not ambiguous with the adverb *almost*, as noted above.

States: States are Static and Durative. Stative verb constellations do not have the linguistic features associated with dynamism. They do not appear in imperatives, as complements of *persuade*, with volitional and instrumental adverbs, with the progressive viewpoint, or in pseudo-cleft sentences. In present perfective sentences they have a specific interpretation. These points are illustrated in (1)-(4) above.

Stative verb constellations are good with adverbials of simple duration; and with momentary adverbials, as in (27):

(27) a. The baby was asleep at noon.
b. The baby was asleep from 2 to 4 this afternoon.
c. Mary was sick for 3 days.

Statives are ungrammatical with adverbs of indirect duration because such adverbs imply activity:

(28) a. *Mary was slowly sick.
b. *The child slowly believed in ghosts.

These sentences are ungrammatical rather than semantically ill-formed. The distributional properties of Stative sentences distinguish them at the level of grammaticality, unlike the other situation types.

Inceptives and egressives are incompatible with States, since they involve change of state. When they appear with a Stative verb constellation the sentence has a change of state interpretation.

(29) a. Mary was sick in an hour.
b. Sam began to be angry.

The linguistic properties associated with the features of completion and non-detachability are not found in Stative sentences since they involve change of state.

This concludes the discussion of the linguistic properties associated with the situation types. The properties can be used as tests for the situation type of a given sentence. They must be modified according to how temporal properties are expressed in a language.

3.2 Derived Situation Types

In this section I consider the range of derived situation types, and the linguistic forms and mechanisms for producing them. I shall say that a derived situation type is formed by a situation type shift. All languages have ways of shifting the aspectual value of a verb constellation.[2] I discuss the main types of situation type shift, and then present a general principle for shifting the situation type of a verb constellation.

3.2.1 Super-lexical morphemes: lexical focus

Speakers may present a situation as a whole, with a broad view. Or they may take a narrower view, focusing on one endpoint or the middle of a situation. In English the broad view usually appears in a simple sentence, e.g. *Mary built a sandcastle*, and the narrower views are conveyed by verbs or phrases that have the simple sentence as a complement, for instance, *Mary began building a sandcastle*; *Mary is in the process of building a sandcastle*; *Mary finished building a sandcastle*. Speakers may present situations from a narrowed point of view, rather than the full view of the basic-level verb constellation.

Morphemes such as *begin* give a narrow view of a situation: this is their function. In contrast, other lexical morphemes contribute to determining the type of situation presented. I will refer to morphemes that give a narrow view of a situation as 'super-lexical' morphemes, and other (relevant) morphemes as 'lexical' morphemes.

Super-lexical morphemes modulate the focus of a situation rather than determining the situation itself. They contrast with high-content, lexical, morphemes. The distinction is very clear in Russian because the language has a rich stock of verbal affixes. (30) presents several Russian verbs; all have the basic verb, but two have prefixes as well.

(30) a. govorit' (speak)
b. ugovorit' (persuade)
c. zagovorit' (begin to speak)

The prefixes of (30b-c) are quite different in semantic function. The prefix *y-* in (30b) "modifies the meaning of the verb to produce a lexical derivative, what is in effect a new verb denoting a type of action different from that denoted by the original verb," as Forsyth puts it. In contrast the prefix *za-* of (30c) "leave(s) unaltered the basic meaning of the original verb but indicates how that action develops or proceeds" (1969:19). Forsyth uses the term "procedural" for forms like *za*; they are also known as "aspectual" (Freed 1979).

Beginnings and endings can be seen as events in themselves: "a transition from a state of affairs to a process (which begins) or from a process which ceases to a state" (Freed 1979:38). Thus the endpoints of all situations are telic events: they bring about a change of state, either into a situation or out of it. The situation type of a beginning or ending is an Accomplishment or Achievement. There are plausible examples of durative endpoints, as (31) illustrates:

(31) a. John gradually started to like Mary.
b. Slowly we began to get ready.
c. The train gradually stopped.

The notion of a gradual endpoint is quite natural with the narrow focus of a super-lexical morpheme. There are subtle differences between them especially inceptives, cf the discussion of *begin* and *start* for English, and of inceptive prefixes in Navajo, in Chapters 8 and 12. Strictly speaking, the term "inceptive" refers to the beginning of an event, while "inchoative" refers to the coming about of a state.

Inceptive focus may be conveyed without a super-lexical verb. The inceptive understanding of a sentence is natural in contexts which make the basic-level reading of the verb constellation implausible or unlikely. For instance, an inceptive reading arises for sentences with an Accomplishment verb constellation and a momentary adverb; a Stative verb constellation may have an inchoative interpretation in the context of a dynamic adverbial, or a *when*-clause, as (32) illustrates.

(32) a. They ate dinner at noon.
b. Suddenly Mary knew the truth.
c. John was dumbfounded when Harry threw the glass.

The main clause of (32c) has a stative and an inchoative reading; the latter interests us here. On the inchoative reading, John became dumbfounded when the glass was thrown.

The situation type of the verb constellation is indeterminate in these examples: both basic-level and shifted interpretations are possible. Shifted inceptive readings without an overt morphological cue are not uncommon; they depend on whether the verb forms of a language are indeterminate.

Egressive interpretations do not arise without an overt super-lexical morpheme, however. A general principle of explanation has been proposed as a universal constraint. As Talmy puts it, a verb cannot denote state-location or state-entry, and also state departure. Thus, the Arabic verb form for 'be/become blind' cannot also mean 'cease being blind', and the English *He hid* can mean 'being in hiding' or 'going into hiding' but not 'coming out of hiding'" (1985:92).

There are super-lexical morphemes that focus on internal stages of a situation, as the examples illustrate:

(33) a. Mary continued to eat peas.
b. Mary went on eating peas.
c. Mary continued to be sick.

Other atelic super-lexical verbs focus on the preliminary stages of a situation. They

include conatives such as *try, attempt* and verbs or phrases such as *on the verge of*. Sentences with atelic super-lexical verbs have the linguistic properties of atelic sentences.

3.2.2 *Multiple-event Activities*

The Activity situation type includes events which consist of a series of events. Multiple-event Activities have a series of repetitions with an arbitrary endpoint. The sub-events may be of all event types.

The verb constellation of a multiple-event Activity sentence has the basic-level category of its sub-events. Such sentences often have durative adverbials which trigger the shift in interpretation from single to multiple event, as in (34):

(34) a. Guy repeatedly knocked at the door.
b. Guy knocked at the door for 5 minutes.
c. Guy was knocking at the door.

Multiple-event Activities may have durative sub-events, as in (35).

(35) a. The wheel revolved all day.
b. The ferry went back and forth for hours.

These example should be distinguished from sentences like *I drew elephants*. Such sentences denote Activities with a cumulative internal structure (due to the bare plural) rather than a series of sub-events.

The derived, multiple-event Activity reading often arises when there is an incompatibility between the times presented in a sentence. The event may typically have short or moderate duration; the temporal adverbial may give a long duration. The multiple-event reading resolves the incompatibility between the times. For instance:

(36) a. Susan coughed yesterday.
b. The wheel revolved this morning.

General world knowledge and the explicit mention of long times both suggest the multiple-event reading. The single-event readings are also possible, of course.

In all these cases, the shift to a derived interpretation is triggered by a form in the context of the verb constellation.

3.2.3 *Habitual Statives*

Habitual sentences are derived in situation type. They present a pattern of situations and are semantically stative. The frequency of the pattern may be stated explicitly, as in (37).

(37) a. Sam rode his bicycle on Fridays.
b. Will wrote a report every week.
c. Jim was often unemployed.

The verb constellation of an habitual stative sentence denotes a single event or state at the basic level of categorization.

The habitual interpretation may also be triggered by information in the context, as (38) illustrates.

(38) a. Susan rode a bicycle last year.
b. Marcia fed the cat last year.

There is a discrepancy between the intervals involved in these sentences. This discrepancy triggers the shift to an habitual stative interpretation. While the adverbials denote relatively long intervals; the events routinely require relatively short intervals. Moreover, both events are routine in nature. Note that (39), which has a similar temporal discrepancy, is unlikely to be taken as habitual:

(39) John moved to a new apartment last year.

The single-event, basic-level reading is natural for this sentence, although the time intervals are also quite different. Moving does not take very long from the perspective of a year; but moving is an important event, not of a routine nature. Moving might well characterize an entire year. These examples show that pragmatic knowledge is essential to the habitual stative interpretation.

Although they are semantically stative, habitual sentences do not have the syntactic characteristics of stative sentences.[3] Instead, they have the properties associated with dynamism. Habituals are good in imperatives, with agent-oriented adverbials, embedding under verbs like *persuade*, and the pseudo-cleft construction. (40) illustrates:

(40) a. Refuse dessert every Friday!
b. Mary deliberately refuses dessert every Friday.
c. I persuaded Mary to play tennis every Friday.
d. What Mary did was play tennis every Friday.

Habituals are also compatible with the progressive, as in (41):

(41) a. At that time, Mary was feeding the cat every day.
b. Tom was playing tennis on Fridays in those days.

These examples are somewhat odd in isolation. They require adverbial and other contextual support.

Habitual sentences have the semantic properties of States, the derived situation type; and the syntactic properties of the events that make them up.

3.2.4 *Marked Focus*

In this section I discuss sentences which present states as events, and events as states. They represent aspectual choices which give a marked focus to a situation. The sentences of (42), for instance, are progressive statives. They present as an event a verb

constellation which is usually taken as Stative. The effect is conveyed by the progressive viewpoint, which is associated with dynamic syntax.

(42) a. I am hating zoology class.
b. She was thinking that she wanted to go home.
c. The river is smelling particularly bad these days.

These examples endow states with dynamism, a property associated with events, and focus on that property. Sentences with an adverbial like *these days* may invite the inference that the situation is unusual. The implication arises from conversational principles. In asserting that a situation obtains, and giving a limited duration, one conversationally implicate that the situation does not generally obtain (Grice 1975).

Speakers may also choose a marked focus which presents events as states. The English cases have a nominal variant of the basic-level dynamic verb with the copular or a low-content main verb, as in (43).

(43) a. The ship was in motion.
b. The cabin is in construction.
c. We are in the process of building a snowman.
d. I am in the midst of writing a report.

In using this type of marked focus, the speaker may wish to emphasize the event's internal stages as continuous, or homogenous. Such sentences are syntactically stative. For instance, they do not allow the progressive viewpoint or the pseudo-cleft *do*:

(44) a. *We are being in the process of building a snowman.
b. *What the ship did was be in motion.

The other forms of dynamic syntax are equally bad.

The sentences of (42) and (43) ascribe to situations a property (dynamism or stativity) which it does not have at the basic level of categorization. Marked focus is similar in function to the super-lexical morphemes. All present a situation from an unusual perspective.

The truth-conditions for sentences with marked and basic-level focus do not usually differ. To assess the truth of a basic-level sentence, one looks for an appropriate situation at appropriate coordinates of space and time. Similarly, to assess the truth of a sentence with marked focus: we look for a situation that corresponds to the basic-level categorization of the sentence.[4] The basic-level verb constellation is always recognizable to the receiver of the sentence.

Summarizing, we have seen that situation type shifts may be explicit, as in sentences with super-lexical morphemes, frequency adverbials, dynamic or static verb morphology. Shifts may also arise by interpretation. The interpretation of shift is triggered by a clash of temporal feature values between a verb constellation and another form. The other forms are adverbials of different kinds, and aspectual viewpoints. I shall call such cases 'interpreted situation type shifts,' to distinguish them from shifts that are due to explicit morphemes.

3.2.5 *A Principle for Interpreted Situation Type Shifts*

Interpreted shifts are due to a clash of temporal feature values which triggers the derived-level reading, as in (45):

(45) Mary coughed for an hour. (Multiple-level Activity)

The adverbial is Durative; the verb constellation is Semelfactive at the basic level, with the temporal feature Instantaneous. The sentence itself has the shifted situation type value of an Activity. In the shift, the adverbial feature overrides the value of the verb constellation.

This exemplifies a general principle which holds for interpreted shifts of situation types: in a clash between the verb constellation and an adverbial, the adverbial overrides.

The principle also holds for viewpoints. The progressive viewpoint is associated with duration; it triggers an interpretive shift to a multiple-event Activity with a Semelfactive verb constellation. The now-familiar examples of (46) illustrate:

(46) a. Mary was coughing. (Multiple-event Activity)
b. Mary was knocking at the door. "

These cases of interpreted situation type shift, like the others, resolve a clash between feature values in a consistent, predictable way.

I will call the principle for interpreted shifts the 'principle of external override.' The principle holds for clashes between the temporal feature values of a verb constellation and those of forms external to it. By this principle, the feature value of an external form overrides the value of the verb constellation.

With the principle of clashing features, we can return to sentences noted above as 'odd' and requiring special interpretation. They all exhibit a clash of temporal feature value between verb constellation and adverbial. Their interpretations follow the principle that adverbial feature values override verb constellation values. The examples illustrate: (47a) has a telic verb constellation and an atelic adverbial; (47b) has an atelic verb constellation and a telic adverbial:

(47) a. John walked to school for ten minutes.
b. Mary sang in ten minutes.

The adverbials determine the interpretation of these sentences. We take (47a) as an Activity, an atelic event in which arrival at school is not envisioned. We take (47b) as presenting a telic event with an unstated goal, a certain amount of singing. Although such sentences are sometimes claimed to be nonsensical, they are quite interpretable by the principle given above: they involve a shift in situation type.

The principle of external override will be formalized later in a compositional rule for derived verb constellations.

3.3 Rules for Composing Verb Constellations

3.3.1 Basic-level verb constellations

In this section I outline formal rules for associating verb constellations with situation types. The main verb and its arguments all contribute to situation type, as we have seen. The interpretation of situation type depends on the particular verb, NPs, PPs, and sentential complements of a verb constellation. The key notion here is interpretation. We compose, or interpret, the situation type of a verb constellation by considering the relevant values of its component forms.[5]

Compositional rules thus provide a natural mechanism for situation type. The rules determine the situation type value of a given verb constellation according to its internal makeup. The rules assign a composite value, an associated situation type, to the constellation.

Syntactic structure does not identify the situation type of a verb constellation. All situation type appear in various structures. (48) illustrates for Accomplishments:

(48) a. Susan arose. (intransitive active)
b. Zipporah walked to the lake. (directional complement)
c. Eleanor cut the bread. (transitive active)
d. The city was destroyed. (passive, deleted agent)

These examples show that Accomplishments are realized in more than one syntactic structure. The lack of correspondence between structure and situation type is also due to the pervasive possibility of situation type shifts.

The compositional treatment requires that the lexicon give the temporal feature values for verbs, and relevant values for other morphemes. The rules sketched here are for English. They would require modification for other languages.

The verb is the aspectual center of a sentence. Verbs have an intrinsic aspectual value, based on its aspectual contribution to a 'maximally simple sentence'. A maximally simple sentence is either intransitive or has a quantized direct object. If a verb constellation in a maximally simple sentence is [+Telic], the verb has the intrinsic feature [+Telic]. (49) illustrates a few verbs, with maximally simple sentences; verb prefixes may also have aspectual value (49e-f).

(49) a. walk $_{V}$[-Telic] Mary walked.
b. breathe $_{V}$[-Telic] John breathed.
c. build $_{V}$[+Telic] Sam built a house.
d. draw $_{V}$[+ Telic] Tim drew a picture.
e. redraw $_{V}[_{prf}$[+Telic] +$_{V}$[+Telic]] Tim drew a picture.
f. untie $_{V}[_{prf}$[+Telic] +$_{V}$[+Telic]] Bill untied the knot.

Verbs also have the intrinsic features [± Dynamic] and [± Durative], which are assigned in a similar manner.

Nominal features are relevant to situation type. The features [Count] and [Mass] are needed on independent syntactic grounds; they determine whether a nominal is quantized or cumulative. The features of prepositional phrases such as [Locative] and [Directional] are also informative and are also needed independently.

The rules compose the values of the morphemes, arriving at a composite value for the verb constellation. For instance, an English verb with the intrinsic feature [-Telic] combines with two arguments in the following way; the notation 'VCon' stands for Verb Constellation.

(50) a. The child walk the dog.
$_{NP}$[+Count] + $_{V}$[-Telic] + $_{NP}$[+Count] → $_{VCon}$[-Telic]

b. The child walk to school.
$_{NP}$[+Count] + $_{V}$[-Telic]] + $_{PP}$[Direct'l] →VCon[+Telic]

The next rule shows how a verb with the intrinsic feature [+Telic] combines with object NPs of different values:

(51) a. The child builds a house.
$_{NP}$[+Count] + $_{V}$[+Telic] + $_{NP}$[+Count] → $_{VCon}$[+Telic]

b. The child builds houses.
$_{NP}$[+Count] + $_{V}$[- Telic] + $_{NP}$[-Count] → $_{VCon}$[-Telic]

I assume that the direct object, etc. are identified in surface structure. The examples are simplified to give an idea of how compositional rules work; see Chapter 6 for more detail.

3.3.1 Derived-Level Verb Constellations

In 3.2.5 I presented a principle for interpreting derived-level verb constellations. The principle has it that the aspectual value of the basic-level verb constellation is overridden by that of an adverbial or other relevant form.

This principle can be stated as a compositional rule. The input to the rule is the interpreted basic-level verb constellation, and the adverbial or other external form. The verb constellation has its aspectual situation type value, as determined by the basic-level compositional rules. The output of the rule is the derived verb constellation with its interpreted aspectual value. I illustrate first with a concrete example, (45) above. The rule reads as follows: a verb constellation (VCon) with certain temporal features, combined with an adverbial, is interpreted as a derived constellation (DVCon) with certain temporal features.

(52) a. Mary coughed for an hour.
b. $_{VCon}$ [+Dyn -Telic -Dur]] + $_{Adv}$[+Dur]
→ $_{DVCon}$[+Dyn -Telic +Dur]

By the principle of external override, the +Durative feature of the adverbial determines the feature value of the derived verb constellation. The feature cluster in the VCon is Semelfactive; the cluster in the DVCon is that of an Activity.

The principle can be stated more generally as an alpha rule. The input to the rule is a verb constellation with a situation type value, given by a cluster of temporal features with certain value (abf); and another form with a temporal feature of a certain value. The output of the rule is a derived verb constellation with the value of the external feature. [f] indicates the temporal feature that appears with different values in the verb constellation and the external form.

(53) $_{\text{VCon}}[a,b, f\alpha] + [f\beta] \rightarrow {}_{\text{DVCon}}[a,b,f\beta]]$

Compositional rules that recognize the contribution of super-lexical verbs, frequency adverbials, etc. could also be written. Rules for shifts to derived situation types are ordered after the rules for interpreting the basic-level situation types.

3.4 Verb Constellations of Interest

Certain sub-types of verb constellations are often discussed, either because they particularly interesting or problematic. I consider three such sub-types in this section.

3.4.1 Perception Verbs, Personal Property Predicates

There are two well-known class es of verb constellations that are stative at the basic level of classification. They include perception verbs [see a star], and personal property predicates [be a hero]. The verb constellations appear in sentences of more than one situation type. In the light of the preceding discussion, we can use the notion of a shift to a derived-level categorization to explain the variation that occurs.

Perception verbs

Verbs of perception tend to appear in sentences that realize both states and dynamic situation types. The pattern is not limited to English. In a broad survey, Viberg 1983 shows that such variation appears in many languages. If a language allows indeterminate verb constellations, perception verbs are likely to be invariant in form, with varying meanings; English and French have such variation.

Verbs of perception may be Stative, denoting a situation without dynamism; they may also be Achievements, referring to changes into such states of perception. Discussing the verb *see*, Vendler notes that the verb appears in Achievement sentences with a "spotting" sense: it gives the moment of perception. Adverbials can make this reading salient, even necessary, as in (54b).

(54) a. I saw a star from my window.
b. Suddenly I saw a star.

(54) is a stative; (54a) is an Achievement, an inchoative sentence that refers to the

coming about of the state of seeing. This use of perception verbs is like other derived inchoatives noted above.

The status of a perception verb constellation is puzzling in some sentences, however. The verb *see* is not a simple stative when it has an Activity complement (Mourelatos 1981:432). (55) illustrates:

(55) a. I saw him run.
b. I saw him running.

These sentences seem to convey that an event of seeing took place. Yet by the tests for dynamism in English, the main verbs are not dynamic. We can't say *I was seeing him run*, or *What I did was see him run*. By syntactic criteria the main verbs are stative, yet the sentences have a special quality that is unique with perception verbs.

There are also sentences in which perception verbs are clearly Activities, as Mourelatos notes:

(56) a. I smelled the air; there were clearly traces of sulphur in it.
b. I felt the nap of the velvet (to see how soft it was).
c. I tasted the soup (to see if it needed salt).

In these sentences there are perception events which involve will and energy. The syntactic test for dynamism bears out this intuition: the sentences are good with pseudo-cleft *do*, e.g. *What I did was feel the nap of the velvet.*. The dynamic reading can be paraphrased with the main verb *take*: *I took a taste of the soup.*

The verbs fit syntactically but not morphologically into a pattern typical of perception verbs in English, as Rogers 1971 points out. There are pairs of active and stative perception verbs, e.g. *see, look at* or *watch*; *hear, listen to*. One member of the pair refers to a state, the other an Activity. What is unusual about *smell* and *feel* is that they have the same form in both active and stative sentences.

Perception verbs appear in at least two situation type categories: as Stative and Activity verb constellations. Intuitively, the Stative situation type is the more basic. There are several pieces of evidence which support the intuition. The lexical span of perception verb constellations is that of a state. Moreover, adverbials or other contextual support is often needed for the non-stative readings, indicating that they are derived rather than basic. Finally, the non-stative interpretations have paraphrases suggesting that they are elliptical forms (*take a taste*); such paraphrases are not available for the perception verbs when they function as Statives.

Personal property predicates

Certain verb constellations denote personal properties, often of a type considered intrinsic to the subject. The constellations are stative; but they also appear in dynamic sentences, as (57)-(58) illustrate.

(57) a. George is obnoxious.
b. George is being obnoxious.
c. What George did was be obnoxious.

(58) a. John was a hero.
b. John was being a hero.
c. What John did was be a hero.

The (a) sentences ascribe an enduring, individual-level property to their subjects. In contrast, the (b) and (c) sentences present transitory, stage-level ways of behaving that involve will and energy, although not necessarily overt activity (*Jane was being quiet*). The observation that predicates like *be a hero, be quiet* may be active as well as stative was first made by Lakoff 1970; see also Lee 1971.

The derived-level interpretation of activity is triggered by the features of dynamic syntax. The active interpretation tends to require contextual support, suggesting that these predicates are Stative at the basic-level of categorization. The active versions have been analyzed as containing an abstract activity verb *do* (Dowty 1979:114).

Other personal property predicates can function as dynamic degree predicates, indicating change along a continuum, as in (59).

(59) a. Joel resembles Aunt Matilda more and more these days.
b. I am more and more homesick these days.
c. These examples seem less and less unacceptable to me.

In these sentences the predicates indicate gradual change with no natural endpoint, somewhat like *widen, cool* discussed in Chapter 2. They can be analyzed as derived in situation type, by the principle of external override. The derived use is triggered by the adverbials, which imply dynamism. Such sentences may sometimes appear felicitously with the progressive, as in (60); (60b) is due to Neil Smith:

(60) a. Joel is resembling Aunt Matilda more and more these days.
b. These examples are gradually seeming less and less unacceptable to me.

The sentences of (59-60) are understood to mean *coming to resemble, getting homesick*, etc. English does not happen to have inchoative forms for *resemble* or *homesick*: so that the use of the stative forms fills a morphological gap.

3.4.2 *Vague Verb Constellations*

Certain verb constellations are vague, with alternative aspectual values. For instance, the verb constellations in (61) may be taken either as Activities or Accomplishments.

(61) a. Mary combed her hair.
b. John mowed the lawn.

On the Activity reading, the processes of hair-combing and lawn-mowing occurred. This reading may be paraphrased with the verb *do*, producing sentences which are not entirely felicitous but faithful to the interpretation: *Mary did some hair-combing, John did some lawn-mowing*. On the Accomplishment reading, both sentences present events with natural final endpoints. Mary's activity resulted in her hair's being combed, John's mowing resulted in a mowed lawn. Note that the examples are good with both durative and completive adverbials, e.g. *Mary combed her hair for 5 minutes, Mary combed her hair in 5 minutes*. The vagueness is due to lexical factors of the verb constellations and pragmatic knowledge about the events.

Vagueness also arises in the interpretation of a telic verb constellation when it denotes an event that can be realized in more than one way. Consider solving a problem. If the problem has several parts the event is probably durative, an Accomplishment. But if the problem can be solved in a single moment, the event is instantaneous, an Achievement. (62) illustrates:

(62) a. Candace solved the problem.
b. Candace solved the problem in an hour.

These sentences can be taken as either as Accomplishments or Achievements and have the patterns of understanding typical of each. Consider (62b). As an Accomplishment, it conveys that the event lasted an hour; as an Achievement, it conveys that the event occurred at the end of an hour.

The vagueness of these verb constellations depends partly on the indeterminacy of English sentences, partly on world knowledge.

This completes the general discussion of situation types. In the next Chapter I consider aspectual viewpoint, the second component of aspectual systems.

Notes

[1] Most apparent counter-examples can be explained as involving change into a state: implied inchoatives. For instance, (i) and (ii) have stative complements:
(i) They persuaded Mary to trust Sue.
(ii) They persuaded Mary to be calm.
Arguably, these are really inchoative, denoting changes into the state of Mary's trusting Sue, or being calm. Other examples apparently present states that can be controlled:
(iii) I persuaded Mary to be on time.
(iii) may involve a state which Mary can control; or, it may also be inchoative.

[2] They are treated as "coercions" from one aspectual value to another in Moens 1987; see also Brecht 1984.

[3] I would like to thank Eser Taylan for pointing these facts out to me.

[4] Marked focus is unique in this respect. Sentences with narrowed focus, multiple-event Activities, and habitual Statives do not have the same truth conditions as their basic-level verb constellations.

[5] The treatment of situation type by compositional rule can be considered as shorthand for complex semantic processes, as elucidated in Krifka 1987, 1989.

CHAPTER 4

VIEWPOINT ASPECT

I begin by discussing the semantic information conveyed by aspectual viewpoints, and semantic tests for the meaning of a viewpoint. The next section, 4.2, presents the main types of aspectual viewpoints, with examples of variations that occur in the five languages of this study. 4.3 sets out several arguments for the independence of viewpoint and situation type. Finally, in 4.4 I discuss pragmatic inferences and conventions of use associated with the viewpoints.

Aspectual viewpoints function like the lens of a camera, making objects visible to the receiver. Situations are the objects on which viewpoint lenses are trained. And just as the camera lens is necessary to make the object available for a picture, so viewpoints are necessary to make visible the situation talked about in a sentence.

The main types of aspectual viewpoint are treated here as categories of Universal Grammar. Universal Grammar provides a general schema for each viewpoint. These general schemata underdetermine the properties of the viewpoints; along certain dimensions they are realized differently in individual languages. The evidence provided by input from a given language enables the learner to fix the parameter for that viewpoint.[1] I will use the terms 'perfective', 'imperfective' and 'neutral' to refer both to the general viewpoint categories and to language-particular instances of them.

Aspectual viewpoints have consistent semantic meanings for the language in which they appear. This is close to the view of Roman Jakobson in spirit. Jakobson claimed that categories such as the imperfective in Russian have an invariant semantic meaning, a *Gesamtbedeutung* which accounts for all uses of that category (1932, 1957). The implementation is rather different from Jakobson's, however: the viewpoint meanings give positive information, and are complemented by pragmatic meanings.

Pragmatic interpretation makes an essential contribution to the interpretation of the viewpoints. At the pragmatic level, semantic meaning interacts with such factors as contrastive value, context, and rhetorical emphasis. Languages differ in the organiza-

tion of their viewpoint systems. There are important language-particular conventions in addition to the general pragmatic conventions of inference and world knowledge.

The information conveyed by viewpoint constitutes its semantic meaning. Semantic meaning is conveyed by linguistic form and cannot be cancelled. Viewpoints span all or part of a situation: more precisely, the temporal schema of a situation. Therefore what information a viewpoint presents is affected, and limited, by the structure of the situation talked about.[2] However, viewpoint must be stated independently of situation type. This point is essential to the two-component theory. It is based on evidence from the viewpoints of different languages as well as theoretical considerations. I will make the case for the independence of the components in Section 4.3, after discussing the range of aspectual viewpoints in some detail.

The analysis of viewpoint is at the heart of the two-component approach. I make several new proposals. I propose that the basic inventory of viewpoints includes the Neutral viewpoint, a default in many languages; the proposal extends the range of the theory to languages without grammaticized viewpoints. I show that viewpoint is independent of situation type. I distinguish the semantic and pragmatic levels of interpretation: I posit explicit, positive meanings at the semantic level, and the traditional notions of contrastive meaning and inference at the pragmatic level.

4.1 Semantic Information and Aspectual Viewpoints

The two-component theory requires that all sentences have a viewpoint, since situation type information is not visible without one. This theoretical requirement has the interesting consequence that sentences with no explicit aspectual morpheme must have an aspectual viewpoint. I posit the Neutral viewpoint as a default for such sentences. The default viewpoint gives partial information, which allows for the interpretations that arise. In addition to the languages discussed here, I draw on the general studies of Comrie 1976, Dahl 1985, and the references in the Introduction.

Visibility: the aspectual information conveyed by a sentence

Aspectual viewpoints focus all or part of a situation; what is in focus has a special status, which I will call 'visibility'. Only what is visible is asserted. Visible information about an event is available to the receiver of a sentence for truth-conditional issues and entailments. The visible information of a sentence is conventional and cannot be changed, or cancelled. Receivers may make additional inference; these are conversational and can be cancelled. The contrast between conventional and conversational meanings, which can and cannot be cancelled, is due to Grice 1975.

The main semantic difference among aspectual viewpoints is in how much of a situation they make visible. Perfective viewpoints focus a situation in its entirety, including endpoints; Imperfective viewpoints focus an interval that excludes endpoints; Neutral viewpoints include the initial point and at least one stage of a situation.

In analyzing aspectual viewpoints, I rely on evidence from semantic tests for the meanings that are conventionally conveyed. The following familiar example illustrates the kind of evidence that I will adduce. Consider the interpretation of (1a), a

progressive, and its composite temporal schema, represented in (1b). An internal stage of the telic event [Mary walk to school] is visible.

(1) a. Mary was walking to school.
b. I . . ////// . . F_N

I claimed above that sentences like (1a) have an open interpretation. I now justify the claim by showing that (1a) does not entail that a complete event occurred. I will use the technique of indirect proof, conjoining the sentence with a clause that asserts non-completion. I then ask whether the conjunction is reasonable or contradictory. If (1a) semantically conveys the completion of the event, such a conjunction should be contradictory. But if not, the conjunction should be reasonable. Consider (2):

(2) Mary was walking to school but she didn't actually get there.

(2) is in fact entirely reasonable. This shows that (1a) does not present a complete event: it does not mean that Mary actually completed her walk to school. In our terms, the final endpoint of the event is not linguistically presented.

There is one inference about endpoints that is licensed by the information of (1a). By a default inference, one can conclude that the initial point of the event has occurred. The inference follows from the fact that part of the event is visible. One might make other inferences about the event, of course. For instance, one might infer on pragmatic grounds that the final endpoint occurred. This second inference might be reasonable if no information to the contrary is given, or if one knows Mary's habits well. The two inferences are quite different in basis. The inference of an initial endpoint is semantically entailed by the material that is visible; whereas the inference of a final point is pragmatically based. The former cannot be over-ridden by other information, whereas the latter can be. Receivers use both types of inference in interpreting aspectual meaning.

Semantic tests for visible information

As tools of linguistic investigation I introduce several simple semantic tests which allow us to investigate the aspectual meaning of a sentence. No one test completely determines aspectual meaning, but together they are quite informative. Conjunctions and questions show whether a sentence presents an open or closed situation. Temporal clauses function as diagnostic contexts. The tests demonstrate well-known properties of familiar perfective and imperfective viewpoints. They are also useful for studying properties of unfamiliar viewpoints.

Conjunction tests are based on the compatibility of two assertions. To test whether an aspectual viewpoint is open or closed in a given sentence, we conjoin it with an assertion about the situation in question. Open situations are compatible with assertions that the situation continues, or was terminated without completion (if the situation is telic). If a sentence is reasonable in conjunction with such assertions, we can conclude that it presents an open situation. One version of this test was used above in sentence (2), repeated here as (3a); (3b) gives another version of the same test.

(3) a. Mary was walking to school but she didn't actually get there.
b. Mary was walking to school and she's still walking.

Both conjunctions are reasonable, showing that the imperfective viewpoint does not entail that Mary actually completed her walk to school. The final endpoint of the event is not visible.

In contrast, the perfective viewpoint is not compatible with assertions of continuation and incompletion, as (4) shows:

(4) a. # Mary walked to school but she didn't actually get there.
b. # Mary walked to school and she's still walking.

The impossibility of conjunction here shows that the perfective presents a closed situation.

Perfective and imperfective sentences are both compatible with assertions that an event is closed, for different reasons. The perfective asserts closure, while the imperfective is compatible with an inference of closure. (5) illustrates:

(5) a. Susan built a house and now it's finished.
b. Susan was building a house and now it's finished.

Both of these sentences are reasonable, though (5a) is somewhat redundant. Conjunctions are not informative about whether a closed reading is semantic or pragmatically licensed. This limits their usefulness in determining the information that is semantically conveyed by an imperfective sentence.

Sentences with temporal clauses give information about the semantic properties of aspectual viewpoints. They do so because they present situations in temporal relation to each other; temporal relations depend on whether the situations are presented with or without endpoints. The minimal requirement for successiveness is that an endpoint of one situation must follow that of the other (Heinämaki 1974). *Before-* and *after-*clauses require a sequential interpretation; they are diagnostic contexts for whether the final endpoint of a situation is semantically visible in a sentence. The main clauses of such sentences must have a closed viewpoint. *When*-clauses are flexible, allowing several interpretations. Both types of temporal clauses are useful in studying viewpoints.

When imposes no particular temporal relation on situations. The situations presented may be taken as simultaneous, overlapping, or successive, depending on viewpoint and situation type. Consider the examples of (6). The temporal clause presents an Instantaneous event; the main clause events differ in duration, and in viewpoint:

(6) a. Mary was swimming when the bell rang.
b. Mary swam when the bell rang.

a' Bill was leaving when the bell rang.
b' Bill left when the bell rang.

In the (a) sentences, the main clause events were in progress at the time of the other event (swimming, preliminaries to leaving). This shows that the imperfective viewpoint does not semantically include endpoints. In the (b) sentences the main clause events began or took place at the time of the other event. The perfective clause is taken as an inceptive in (6b') because swimming is a durative event. It is not plausible that a swimming event occur in its entirety at the same time as a bell ringing, but entirely plausible that it begin at that time.

Despite the flexibility of *when*, the sequential reading does not arise for sentences with an imperfective viewpoint in the main clause. Thus sentences with *when*-clauses function as diagnostic contexts for the interpretation of viewpoint. There is a preferred pattern of interpretation for perfective sentences. If the situations are successive, the event of the *when*-clause is taken as preceding (Steedman 1981). As I will show below, the test allow us to discriminate between imperfective and neutral viewpoints: the former does not allow a sequential interpretation, whereas the latter does.

Sentences with *before-* and *after-*clauses are also useful. They require a sequential or overlapping relation between situations. They are odd, even ungrammatical, with a main clause in the imperfective viewpoint. Compare the sentences of (7):

(7) a. John left after Mary broke the glass.
b. John was angry after Mary broke the glass.
c. ?*John was singing after Mary broke the glass.

The context of a *before-* or *after-*clause indicates whether the viewpoint of a sentence is imperfective.

Questions can also function as tests that delimit the semantic meaning of a sentence. If the sentence presents an open situation, questions about its continuation are reasonable; if the situation is closed, such questions are not reasonable. (8) illustrates:

(8) a. Martin walked to school.
b. Martin was walking to school.
c. Did he get there?

The question is a reasonable one for the imperfective sentence, but strange with the perfective because the latter gives the answer.

These tests and variants along the same lines will be used to establish the semantic meaning of the viewpoints.

4.2 Families of Viewpoints

Knowing a language includes knowing the semantic and pragmatic values of the viewpoints in that language. Perfective viewpoints are closed informationally, in the sense that they present situations as complete with both endpoints. Imperfectives are open. Neutral viewpoints allow readings that either both closed or open, although the information given by a neutral viewpoint is not identical to that of an imperfective.

These meanings have an important effect on the information structure of a sentence: imperfectives are open to inference in a way that perfectives are not. Further, sentences with the neutral viewpoint are open in a way that imperfectives are not.

The distinction between closed and open situations pertains not to real time but to conceptual or narrative time. What a sentence conveys is a conceptual presentation. More formally, linguistic information licenses the semantic representation associated with a sentence as open or closed. Situations presented with and without endpoints affect interpretation when they appear in isolation. The presence of endpoints also has consequences in discourse. "The difference in representations with and without endpoints ought to show up in the possibilities . . . for the interpretation of sentences which follow them. That is, one would . . . expect that when trying to place the..constituent introduced by the next sentence within the narrative time structure we have already constructed, we would be able to make use of . . . end points" (Kamp & Rohrer 1989: ch 1, 15-16).

Viewpoint aspect is expressed by a grammatical morpheme associated with the main verb of a sentence. The morpheme may simply indicate the viewpoint, or may have lexical content as well. Of the languages studied here, Chinese and Russian have perfective morphemes with clear lexical content. In analyzing an aspectual system it is necessary to consider temporal location (indicated by tense, adverbials, and modals) as well as viewpoint. Temporal location is discussed in Chapter 5 and in the analyses of individual languages presented in Part II.

Situations provide the locus for aspectual viewpoints. There are different patterns of interaction between viewpoints and situation types of a language. They can be understood in terms of the notion of dominance: a language may or may not have a dominant viewpoint. Some systems are asymmetric: one viewpoint is limited and another is not, e.g. English and Russian. In these languages the 'dominant viewpoint' is available for all situation types. In other languages all viewpoint choices are available to all situation types, and no viewpoint is dominant. French is an example. In others, viewpoint choices are available only for non-statives, so that statives are in effect outside the viewpoint system; Chinese and Navajo are of this type.

The viewpoint of a sentence presents all or part of a situation: more precisely, all or part of the temporal schema of a situation. Temporal schemata are associated with the viewpoints, as well as with the situation types. The aspectual meaning of a sentence is a composite of the situation type schema and the viewpoint schema. I now discuss the main viewpoint types, with examples of viewpoints in the languages analyzed in Part II.

4.2.1 Perfective viewpoints

Sentences with a perfective viewpoint present a situation as a whole. The span of the perfective includes the initial and final endpoints of the situation: it is closed informationally. This is the basic property of the perfective; the general schema is given in (9).

(9) General schema for the perfective: I F
////////

This general schema represents the unmarked perfective viewpoint. As such it does not apply to stative situations, because endpoints do not appear in the temporal schema of a state. Nor does the schema include perfectives with a span greater than that of the situation schema focused. Perfective viewpoints that have these additional properties are marked in relation to the prototypical perfective.

I now demonstrate some of the semantic properties of perfective sentences. I will be interested in the closed readings that are typical of perfectives, using English as an example. Since we are concerned with the meanings conveyed by linguistic forms, we must distinguish between semantic meaning and the implications that may arise from its presence in a sentence. We ask whether an interpretation is due to semantic meaning alone, or whether it includes pragmatic inference. To answer the question we will put the sentences in contexts where their interpretation might be expected to vary. If an interpretation remains invariant, it is conveyed by the linguistic form and is part of the semantic meaning of the sentence.

The English perfective viewpoint is often called simple aspect because it is signalled by the simple form of the main verb; the imperfective is signalled with the auxiliary *be+ing*. The perfective is incompatible with an assertion that the event continued. Consider the interpretation of non-stative sentences with the perfective viewpoint:

(10) a. Lily swam in the pond. (Activity)
b. Mrs Ramsey wrote a letter. (Accomplishment)
c. Lily coughed. (Semelfactive)
d. Mr Ramsey reached the lighthouse. (Achievement)

There are two points to notice about the interpretation of these sentences. They present the events as closed, with initial and final endpoints (for durative events); and the events are taken as terminated or completed depending on the situation type of the sentences. (10a,c) present terminated events, while (10b,d) present completed events.

The interpretations are due to the semantic meaning of simple aspect and not to pragmatic factors. To substantiate this claim, I put the sentences in contexts that are not compatible with the closed readings just given, by conjoining them with assertions that the events continue. If the closed readings are due to inference they will change in this context to open readings. But the readings will not change, and the conjunctions will be contradictory, if the interpretations are conveyed semantically. The examples of (11) demonstrate.

(11) a. # Lily swam in the pond and she may still be swimming.
b. # Mrs Ramsey wrote a letter and she may still be writing it.

The conjunctions are contradictory, showing that the closed readings are based on the semantic meaning of simple aspect. (This statement oversimplifies the interpretation of Activity sentences. In discourse contexts the interpretation is more flexible. The perfective imposes an implicit bound, but the event need not actually terminate.[3])

Now consider the type of final point conveyed by the perfective sentences: do they convey termination or completion? The interpretations vary with situation type. The Activity sentence conveys termination (Lily stopped swimming) whereas the Accom-

plishment conveys completion (Mrs Ramsey finished the letter). The difference may be due to the semantic meaning of the sentences, but it may also be due to inference which augments that information. It would be natural to infer that the telic event had been completed, since we are given no information to the contrary. Conjunction is again useful. If the simple viewpoint semantically conveys completion, an Accomplishment sentence should be incompatible with the assertion that the event was terminated rather than completed. This prediction is tested in (12):

(12) a. # Mrs Ramsey wrote a letter, but she didn't finish writing it.
b. # James fixed the clock, but he didn't finish fixing it.
c. # Mary opened the door, but she didn't get it open.

The conjunctions are contradictory, showing that the implicature of completion cannot be cancelled. The conjunction tests show that the implicature is conventional rather than conversational. Conventional implicatures are conveyed by the meaning of linguistic forms: thus, perfective viewpoint Accomplishment sentences in English semantically convey completion.

The interpretations vary according to the situation type of a sentence in English simple aspect. If the situation type schema has a natural endpoint, so does the perfective sentence. This interaction between situation type and the perfective viewpoint occurs in French and a number of other languages. It does not occur in all languages, however: Chinese has a different system.

The Chinese perfective morphemes (there are two) convey termination for all nonstative events. The notion of completion is expressed by a set of optional, independent morphemes known as Resultative Verb Complements. The examples illustrate with the perfective morpheme *-le* and an Accomplishment sentence. (13a) does not entail that the event was completed, as (13b) shows.

(13) a. Wo zuotian xie-le yifeng xin.
I yest'day write-LE oneCL letter
I wrote a letter yesterday
b. Wo zuotian xie-le yifeng xin, keshi mei xie-wan.
I yest'day write-LE oneCL letter, but not write-finish
I wrote a letter yesterday but didn't finish it

If the conjunction in (13b) were contradictory, we would conclude that the perfective *-le* necessarily indicates completion. In the absence of information to the contrary, *-le* often suggests completion. But the suggestion is conversational. Completion is indicated unequivocally by another morpheme: the completive morpheme *-wan*, a Resultative Verb Complement, which may appear in addition to *-le*. (14) illustrates; the English translation cannot be made with a simple verb.

(14) a. Wo zuotian xie-wan-le yifeng xin.
I yest'day write-WAN-LE oneCL letter
Yesterday I wrote (and finished) a letter

b. # Wo zuotian xie-wan-le yifeng xin, keshi mei xie-wan.
I yest'day write-LE oneCL letter, but not write-finish
I wrote a letter-finished a letter yesterday but didn't finish it

(14a) entails that the event was completed, as (14b) shows. Resultative Verb Complements in Chinese have lexical content. One might relate them to particles such as *up*, which have a perfective force as in *wash up, eat up*); other such morphemes give information about the resultant state of a telic event. Hindi has a similar system, with an independant morpheme that unequivocally indicates completion (Singh 1991).

Russian also has perfective morphemes with lexical content. They appear in Activity sentences with the perfective viewpoint. The perfective viewpoint is indicated by the prefixes *po-* and *pro-*. These prefixes are perfective in viewpoint, and give an explicit bound for the Activity event. (15) illustrates, with an Activity verb *begal* (run).

(15) Ivan pobegal dva casa.
Ivan ran[Perf] two hours
Ivan ran for two hours

The prefixes, known as delimitatives, indicate that an Activity is specifically limited. They also contribute an additional nuance of meaning. *Po-* indicates that the duration of the event is short; *pro-* suggests that the interval is unexpected in some way. The claim that these prefixes are part of the viewpoint system is defended in the discussion of Russian. The Russian perfective requires that the boundary of an event be lexically indicated. The delimitative prefixes anchor an Activity to a specific interval of time (Flier 1985: 49). The other perfective morphemes occur with telic verb constellations and do not have lexical content.

The parameter of statives and the perfective viewpoint

Perfective viewpoints prototypically include the endpoints of a situation, so that the schema of the Universal Grammar perfective does not apply to statives. The endpoints, or changes into and out of a state, are not part of the state itself. No prediction about perfectives and statives is made by Universal Grammar: this parameter varies according to individual languages. There are three different relations between statives and the perfective viewpoint in the languages studied here. The perfective includes changes into and out of a state and thus applies to the stative sentences (French); the perfective does not include the endpoints of states, departing from the canonical structure by presenting open stative situations (English); the perfective does not apply to statives at all (Russian, Chinese, Navajo). This variation is not a problem for the theory, or for learners of these languages. The child learning the aspectual system of each language can conclude from positive evidence whether and how the perfective viewpoint applies to states.

In French the perfective viewpoint is available for all situation types with a consistent closed interpretation. (16a) is a Stative sentence in the *Passé Composé*, one of the perfective past tenses of French. The conjunction in (16b) shows that the situation is presented as closed: (16b) is contradictory.

(16) a. Marie a vécu à Paris.
Marie lived in Paris
b. # Marie a vécu à Paris et elle y vit encore.
Marie lived in Paris and she still lives there.

The stative cannot have the interpretation that Marie continues lives in Paris as part of the same ongoing state.

In English the perfective viewpoint appears with stative verb constellations. Such sentences present situations that are not necessarily closed. Rather, Stative sentences in English allow either an open or closed interpretation. (17a) for instance may felicitously accept either of the continuations below:

(17) a. Jennifer knew Turkish.
b. ...but she has forgotten it all (closed)
c. ...and she still knows it (open)

Both readings are possible because the first moment of a state is like every other moment. The analysis is discussed further in Chapter 8.

The perfective is not available to statives in Chinese, Russian, and Navajo. These languages have no perfective sentences with stative verb constellations and the interpretation of a basic-level stative situation type. Stative verb constellations do allow the perfective viewpoint when they undergo a shift in situation type. They appear as inchoatives, in derived telic sentences. As such they present a change into the state which the verb constellation lexically denotes. In situation type they are either Achievements or Accomplishments, depending on the feature of duration. The inchoatives vary depending on the pattern of the language. In Chinese they appear with some statives but are ungrammatical with others, as (18) illustrates:

(18) a. Mali bing-le.
Mali sick-LE
Mali got sick

b. * Mali congming-le.
Mali intelligent-LE
Mali became intelligent

The possibility of a derived inchoative is partly predictable from the semantic class of the stative predicate. Stage-level stative predicates can appear with viewpoint morphemes on a telic reading, as above; but individual-level predicates do not allow this construction. The coming about of a predicate such as *congming* can only be expressed with a lexical verb like *chengwei* (become); see Chapter 11 for discussion.

In Russian the possibility of derived telic sentences with basic-level stative verb constellations depends on morphology. If a perfective form is available for a stative constellation, it functions as a derived telic with that form. In Navajo, an inceptive prefix on a verb base is required for the inchoative interpretation. Such forms are available for many but not all statives.

Other marked perfective viewpoints

There are marked perfective viewpoints which have a span beyond the situation in focus. The most common is the Perfect, a complex construction that involves temporal location as well aspectual information; it is discussed in Chapter 5. Another marked perfective in the languages investigated here is the *-guo* viewpoint of Chinese, sometimes known as the 'experiential *-guo*'. The *-guo* viewpoint extends beyond the final endpoint of a situation.

The *-guo* viewpoint presents a telic event and asserts that the final state no longer obtains. Thus the span of the viewpoint goes beyond the final endpoint of the event. (19) illustrates: the meaning of the viewpoint cannot be conveyed directly in an English translation.

(19) a. Mali shang-ge yue qu-guo Xiang Gang.
Mali last CL month go-GUO Hong Kong.
Mali went to Hong Kong last month (no longer there on the same trip).

b. Wo bing guo.
I sick GUO.
I was sick (no longer sick with the same sickness).

These sentences convey semantically that Mali is no longer in Hong Kong, that I am no longer sick. The presentation of the viewpoint requires a discontinuity between the final stage of a situation and the current state of affairs. The final stage of the situation no longer obtains. At a more fine-grained level of analysis, the notion of discontinuity has different forces with different types of events. (19) presents telic events with transitory resultant states. They involve an affected subject or object. The notion of discontinuity is vacuous for atelic situations and telic situations with non-transitory final states and experiencer subjects, such as eating a meal or reading a book, as Yeh (1996) points out; see Chapter 11.

The conjunction test demonstrates that the interpretation of discontinuity is semantically required by the *-guo* perfective. If it arises pragmatically, the interpretation should disappear in the context of an assertion that the state continues. But in fact the *-guo* perfective cannot be conjoined with an assertion of the continuing final state. (20) illustrates; the first conjunct is the *-guo* perfective of (19a):

(20) # Tamen shang ge yue qu-guo Xiang Gang; hai zai nar.
they last CL month go-LE Hong Kong; still at there
Last month they went to Hong Kong and they are still there

The sentence is contradictory, as predicted by the analysis given here.

To account for the span of this viewpoint we need a representation that is not dependent on the event itself. The representation must allow the viewpoint to span an interval that includes the event and a subsequent stage that differs in the relevant way. The span of *-guo* is represented in (21). The top line represents the temporal schema of an event. I and F are its endpoints, F+1 indicates a stage distinct from the final stage; more formal statement of the viewpoint will specify that F+1 requires a change of state from F.

(21) Span of the perfective *-guo*: I F F + 1
////////////

The *guo* perfective viewpoint appears with the full range of situation types. The durative event in (21) is representative only.

Punctual presentation and perfective viewpoints

Perfective viewpoints tend to present situations as punctual. The impression of punctuality arises from the closed nature of the perfective presentation. We conceive of a punctual situation as a simple, closed structure which appears at a point of time. When situations follow each other in time we may think of each situation as occupying a point whatever its actual duration. Given a time line studded with dots, a dot may stand for a war, a battle, an explosion. But to say that a punctual event occupies "a point of time" in this way makes no claim about what literally happens in the world, or about the time course of the idealized event. As Lyons puts it, the notion of punctuality is subjective and pragmatic (1977: 708-710). Punctual presentations of situations allow the speaker to convey narrative or other pragmatic meanings.

The perfective linguistically presents situations as punctual whether or not they actually have internal structure, and whether or not they actually take time. Achievements and Semelfactives, which are instantaneous and have no internal structure, are perhaps prototypical punctual situations. But situations that take a moment, a few minutes, or years, can all be presented as punctual. Evidently, a 'punctual situation' does not correspond to an actual point, either conceptually or truth-conditionally. In fact, such points may be entirely impressionistic: there may not be such minimal points in actual theory or in practice. Many scholars view time as dense rather than discrete; if this view is correct, there is no smallest unit of time and the notion of a temporal point is essentially subjective and arbitrary.[4]

Not all perfectives are punctual in presentation. Duration can be explicitly asserted in sentences with the perfective viewpoint:

(22) a. The king reigned for thirty years.
b. I wrote the sonnet in 5 minutes.

The examples show that the perfective presentation of a situation is entirely compatible with expressions of durativity. This seems odd only if the properties punctual and durative are in contrast. In fact they do not contrast in the perfective viewpoint. Semantically, the perfective presents events as closed, with no information about duration. The punctual interpretation is strongest and most natural when duration is not explicitly mentioned in a sentence. This notion of 'punctual' is quite different from that of an event that is instantaneous in principle, or adverbials that refer to a point in time. To avoid confusion I will refer to the perfective as presenting 'closed' situations, reserving the word 'punctual' for the impressionistic perfective presentation. I call Achievements and Semelfactives 'instantaneous', and for adverbials referring to a point I use the word 'momentary'.

Perfectives vary considerably across languages. They may emphasize completion

or termination rather than the occurrence of an event as a whole, but need not do so (as Comrie shows: he presents a useful set of counter-examples to some general claims about the perfective 1976: 17-24). I summarize the chief endpoint differences among perfectives in the languages studied here. The perfective may vary in meaning according to the endpoint type of a situation: telic events have natural endpoints, atelic events have arbitrary endpoints. Perfectives vary this way in English, French, Russian, and Navajo. But in Chinese perfectives termination and completion are expressed separately for all situation types. Perfective morphemes have lexical content in Chinese and Russian, but not in the other languages studied. For Activities, durative atelic events, Russian requires the explicit presentation of a specific final endpoint; most languages do not. This list does not include differences in conventions of use, which also affect the interpretation of viewpoint aspect.

4.2.2 *Imperfective viewpoints*

Imperfective viewpoints present part of a situation, with no information about its endpoints. Thus imperfectives are open informationally. The unmarked imperfective spans an interval that is internal to the situation. This conforms to the general principle that the span of a viewpoint coincides with all or part of the temporal schema of the situation. (23) gives the span of the unmarked imperfective.

(23) General imperfective temporal schema: I . . ///// . . F

This skeleton schema conveys the information of imperfective viewpoints. Marked imperfective viewpoints span the preliminary stages of events or the resultant stages of telic events.

The two most common imperfectives are the general imperfective and the progressive. The former focuses intervals of all situation types; the latter applies only to non-statives. In 4.3.2 I consider the relation of the imperfective to states, a frequent topic in current semantic discussions of aspect.

The French *Imparfait* exemplifies the general imperfective viewpoint; it is a past tense with imperfective aspectual value. The viewpoint appears with sentences of all situation types with internal stages, as (24) illustrates. The superscript indicates viewpoint.

(24) a. La mer était calme.
The sea was^{Impf} calm (Stative)
b. L'enfant pleurait.
The child was crying^{Impf} (Activity)
c. Ils bâtissaient une cabine.
They were building^{Impf} a cabin (Accomplishment)

The English translations are, of course, only approximate: the English progressive is the closest translation equivalent but it differs subtly from the *Imparfait*. I use the conjunction test to ask whether the *Imparfait* presents events as continuing, or open. (25) conjoins (24b), an Activity sentence in the *Imparfait*, with an assertion in the

Présent that the event may still be in progress. The result is reasonable, showing that the viewpoint of the first conjunct is open.

(25) Ce matin l'enfant pleurait; peut-être qu'il pleure encore.
This morning the child cry[Impf]; perhaps he is still crying[Pres]

The information in the first conjunct would also be consistent with an assertion that the child is no longer crying, of course. Imperfective viewpoints and Instantaneous events are discussed in 4.2.2 below.

Progressives focus on the internal stages of non-stative events. Dahl notes that progressives tend to appear in all tenses if a language has tense (1985:92). In contrast, general imperfectives tend to be limited to past tenses. Among the 64 languages for which Dahl collected information, at least 28 had progressives. Of the languages studied here, English has a progressive, French and Russian have general imperfectives, Chinese a progressive and a resultative, Navajo a progressive and an imperfective.

The English examples illustrate for Activities and Accomplishments, which are both events that have internal stages; (26c) a Stative, is ungrammatical.

(26) a. Kelly was singing. (Activity)
b. Ross was climbing a tree. (Accomplishment)
c. *Bill was knowing the answer. (Stative)

The progressive viewpoint has meanings that do not arise for other types of imperfective. Nuances of activity, dynamism, and vividness are often associated with sentences of this viewpoint. The connotations can be traced to the requirement of non-stative events for the progressive. The stereotypes of such events involve activity and change; the connotations invoke the stereotypes. In contrast, the *Imparfait* appears with all situation types, and lacks the connotation of dynamism typical of the progressive.

Imperfective viewpoints do not linguistically present closed situations, although they allow inferences about beginnings and endings. The distinction is brought out by linguistic contexts that involve open or closed readings. In such contexts closed readings arise only with perfective viewpoints. I illustrate with English progressive sentences in contexts that invite and require a closed reading, a *when*-clause and an *after*-clause.

(27) a. John was singing when Mary knocked at the door.
b. ?* Herbert was hiding the loot after the telephone rang.

In these examples the main clauses are progressive. With the *when*-clause only an open reading is available (27a); with the *after*-clause, which semantically requires a closed main clause, the sentence is ungrammatical (27b). These examples contrast with the sentences of (28), in which the main clauses are perfective and have a closed interpretation. In (28a) the events must be successive, in (28b) they may be successive or overlapping.

(28) a. John sang when Mary knocked at the door.
b. John was happy when Mary knocked at the door.

The Activity main clause in (26a) has a closed interpretation only. The main clause in (26b) has both an open Stative and a closed event interpretation. On the Stative reading John was already happy before Mary knocked; the open interpretation is typical of English perfective statives. On the event reading, which is closed, John became happy at the time of her knock. Closed readings are typical of English perfective non-statives. The two readings depend on whether the verb constellation is taken as a Stative or as a shifted inchoative. The contrast between (27) and (28) shows that sentences in the progressive are not available for a closed interpretation. The interpretation of *when*-clauses depends on viewpoint, situation type, and pragmatic factors (Boertien 1979, Dowty 1979, Steedman 1981, Smith 1984).

Marked imperfective viewpoints

In this section I discuss imperfective viewpoints that focus on the external stages of a situation, focusing the preliminary and/or the resultative stages of a situation. Such viewpoints are marked.

Since they have no internal stages, we would predict that imperfective viewpoints do not apply to instantaneous events. In fact the imperfective is often available for Achievements. Imperfectives present the preliminary stages of the event; there is no suggestion in such presentations that the Achievement actually takes place. English, French, Russian and Navajo have imperfectives of Achievements, whereas Chinese does not. I present English and Chinese examples; *zai* is the morpheme of the Chinese progressive.

(29) a. The team was reaching the top.
b. She was winning the race.
c. *Lao Wang zai dao dingfeng.
Old Wang ZAI reach summit.
Old Wang is reaching the top.
d. *Ta zai ying sai pao.
she ZAI win race run.
She is winning the race.

The temporal schema for the Achievement situation type includes preliminary stages, for languages where the imperfective may focus preliminary stages. Semelfactives, which are also single-stage events, never appear with imperfectives with the interpretation of a preliminary interval. The temporal schema of a Semelfactive has no preliminary stages. This device accounts for the facts, but does not explain them. I suggested in Chapter 2 that this difference between Achievements and Semelfactives may be due to the conceptual primacy of changes of state for human beings.

Preliminary focus for durative events is also possible. Navajo sentences allow such a focus with contextual support, as (30) shows; the verb base denotes a durative event:

(30) Shidibé k'adęę da'adlą.
sheep almost drink Impf B: Dur.
The sheep are about to drink.

In Navajo preliminary focus requires the adverb *k ádęę* (almost) for durative events; see Chapter 12. Russian also allows this interpretation, which is known as 'conative.' The other languages require additional lexical material for sentences of this type.

Resultative imperfective viewpoints present a state that follows the final point of a telic event. More precisely, such viewpoints focus an the interval after the change of state. Resultatives occur in Chinese and in English, as the examples illustrate; *-zhe* is the morpheme for one of the Chinese imperfective viewpoints:

(31) a. Ta zai chuang shang tang-zhe.
he at bed on lie ZHE
He is lying on the bed

b. Men shang xie-zhe sige zi.
door on writeZHE 4 CL character
Four characters are written on the door

c. Your socks were lying on the bed.
d. The statue is standing on the corner.

The English sentences (31c-d) are stative syntactically and semantically, although morphologically indistinguishable from progressives. They are discussed in Chapters 2 and 8. Resultatives present a state via the event that brings it about: the lexical span of the verb constellation includes a change of state.

When transitivity and morphological factors allow, a sentence can be ambiguous between an eventive and a resultative reading. In the former case the imperfective or progressive viewpoint focuses an internal interval of the situation; in the latter, an external interval. (32) illustrates for English and Chinese:

(32) a. John was sitting in the chair.

b. Tianli zhong-zhe huar.
land-in plant-ZHE flower

Both sentences are ambiguous in the same way. On the internal reading, an event is in progress: John is in the process of seating himself, the planting process is going on. On the resultative reading the events have already taken place, and the resulting state is focused. John is already seated and the flowers are already planted. The resultative is an important pattern in Chinese, and in other Asian languages; it is one of the major stative patterns in Japanese (Jacobsen 1982, Talmy 1985, Ogihara 1989, Du 1996).

Resultative viewpoints can be handled naturally within the two-component framework, since they span a period not included in the event proper. The schema of (33) illustrates:

(33) Resultative imperfective viewpoints: I . . . . F . . //// . .

Sentences with a resultative imperfective focus are distinct from verb constellations that lexically denote the resultant states of a telic event. (34) illustrates the latter:

(34) a. Mary cooked the roast medium rare.
b. Richard sliced the carrots into rounds.

These sentences lexically denote the resultant state of a telic event.

Imperfective viewpoints may inherit or impose temporal properties on the stretch of a situation that they focus. We have already discussed examples from English. The progressive viewpoint inherits the property of dynamism from the events to which it neutrally applies. Progressive stative sentences are marked, and convey the dynam-ism of an event. There is even stronger evidence in Chinese, which has two imperfective viewpoints. The analysis of imperfectives must be rich enough to account for the Chinese imperfectives *zai* and *-zhe*, which differ in distribution and in meaning. *Zai*, a dynamic progressive, is available neutrally to non-statives; *-zhe*, a stative imperfective, is available neutrally to statives and has a relatively wide derived range. The difference between these viewpoints can be handled by the formal device of inheritance. The resultative viewpoint indicated by *-zhe* has a static property, which is imposed on all situations that the viewpoint focuses. We provide for this by associating a static feature with the viewpoint. Through inheritance, we provide that properties of one representation are carried over, or inherited, into a representation which is derived from the first.

Analysis of the Chinese imperfective viewpoints shows that progressives are distinct from statives. I return to this question in Section 4.3.2 below. Using inheritance, we can say that each imperfective inherits properties of the situations that it focuses. The fact that their distribution is different explains the properties they inherit. The progressive *zai* inherits the stage property from the temporal schema of events. But since states are the basic domain of the stative imperfective-*zhe*, this viewpoint does not inherit the stage property. The presence or absence of the stage property correctly distinguishes intervals focused with *zai* and *-zhe*.

The extended, marked uses of a viewpoint can be accounted for by allowing it to impose a temporal property on the interval that it focuses. In its marked use the progressive imposes the stage property on stative situations. Similarly, the imperfective *-zhe* imposes a stative coloration on non-stative situations. See the sections on these viewpoints in Chapters 8 and 11 for further discussion.

4.2.3 Neutral Viewpoints

In this section I discuss sentences that are aspectually vague; they lack a viewpoint morpheme. I argue that such sentences, which have neither a perfective nor an imperfective morpheme, should be analyzed as having the Neutral viewpoint. The Neutral viewpoint is a default with a positive semantic value. It arises in aspectual systems which allow sentences without a viewpoint morpheme. There are both empirical and theoretical reasons for positing a default viewpoint.

Empirically, the interpretation of aspectually vague sentences can be shown to be

neither perfective nor imperfective. Such sentences are more flexible than either viewpoint, in that they allow both open and closed readings. Do we endow such sentences with a new viewpoint, or say that they simply have no aspectual viewpoint? The latter view seems plausible, since context often indicates the favored interpretation. I will argue for the second, more radical view. Both the range of meanings that is found for aspectually vague sentences, and the theory-internal requirement of visibility, suggest that they have a viewpoint that is open but not unlimited.[5]

The argument will take the following form: I begin by considering the interpretation of sentences that lack a viewpoint morpheme, using the semantic tests introduced above. I will refer to sentences that lack a viewpoint morpheme as LVM sentences. I show that both perfective and imperfective readings arise. This finding rules out the possibility that LVM sentences actually have one of the familiar aspectual values. I then investigate further the interpretations that LVM sentences may have. I show that certain readings do not arise. This finding rules out the possibility that LVM sentences have no aspectual viewpoint and allow thus free interpretation.

The evidence from interpretation supports the idea that there is a specific viewpoint value for LVM sentences. They allow closed and open readings, but are not entirely unconstrained. To account for the facts I suggest a viewpoint that is informationally open. It differs from both the perfective and the imperfective. The Neutral viewpoint is weaker than the perfective in allowing open readings. It is stronger than the imperfective because it allows closed readings.

I now present examples showing that LVM sentences allow both open and closed readings, depending on context. I use examples from French, Chinese, and Navajo. Consider first the future tense of French, the *Futur*, which conveys no viewpoint information.[6]

In the context of a *when*-clause the *Futur* presents situations that can be taken as open or closed. The determining factors are situation type, context, and world knowledge. Consider the main clause of (35), which has an Activity verb constellation.

(35) Jean chantera quand Marie entrera dans le bureau.
Jean will sing^{Fut}when Marie will enter^{Fut} the office.

The main clause has an open and a closed reading. The closed interpretation is an inceptive one: Jean will start singing at the time of Marie's entrance. On the open interpretation, Jean will already be singing when Marie enters. The inceptive possibility clearly distinguishes these examples from imperfectives, which do not allow such an interpretation; recall (27a) above.

According to native speakers of French, the closed interpretation is natural for (35) although both are possible. With different lexical items, the situation changes: in (36) the open interpretation is more natural:

(36) Jean dormira quand Marie entrera dans le bureau.
Jean will sleep^{Fut}when Marie will enter^{Fut} the office.

On the open interpretation, Jean is already asleep when Marie enters. The closed interpretation is inceptive here too. These examples demonstrate that the *Futur* can present

open or closed situations. This range of interpretation is not available for either the perfective or the imperfective viewpoints. Note that both sets of examples are needed to make this point. One could argue that the apparently open reading actually arises from the inceptive, which presents the beginning of the event has taken place. But this doesn't explain the preferred open reading of (36). The French *Présent* tense also has the Neutral viewpoint; see Chapter 9 for further discussion.

Chinese LVM sentences have similar interpretations. Viewpoint morphemes are syntactically optional in Chinese, and LVM sentences are not uncommon, especially in discourse.[7] They do not normally occur in sentences with *when*-clauses, because *when*-clauses are generally used to foreground the event in the main clause. The main clause, foregrounded, events usually have a viewpoint morpheme. But for speakers who accept them, LVM sentences with *when*-clauses can be interpreted to present open or closed situations. For instance, some native speakers accept sentences like (37) with the two readings given.

(37) a. Zhangsan dao jia de shihou, Mali xie gongzuo baogao.
Zhangsan arrive home DE time, Mali write work report

b. When Zhangsan arrived at home, Mali wrote the work report
c. When Zhangsan arrived at home, Mali was writing the work report

On the closed reading the main clause is inceptive: Mali began writing at at time roughly simultaneous with Zhangsan's arrival (37b). On the open reading, the main clauses presents an ongoing event: Mali was already writing at the time of Zhangsan's arrival (37c).

Questions also bring out the flexibility of interpretation that is typical of LVM sentences. For (38a), an Accomplishment sentence,the question in (38b) is appropriate; (39) gives some possible answers.

(38) a. Mali xie gongzuo baogao.
Mali write work report
b. Ta hai zai xie ma?
she still ZAI write MA?
Is she still writing

(39) a. Hai zai xie.	b. Xie-le.	c. Xie wan-le.
still ZAI write.	write-LE.	write-finish-LE.
She is still writing.	She stopped.	She finished.

Strikingly, all the answers are reasonable, showing that both open and closed readings are available for (38a).

The same range of interpretation appears in LVM sentences of Navajo. I illustrate with two temporally related sentences in the Usitative and Iterative modes. The construction is similar to a *when*-clause; there is no overt Navajo morpheme which corresponds to *when*. These modes contrast with explicit viewpoint morphemes in Navajo, and have the Neutral viewpoint.

(40) a. dibé nanishka'go hodootał.
when I herd sheep, he sing Usit...Usit.
b. hastiin na'ádlı̨ihgo, ch'ínáshdááh.
When my husband drinks, I leave Iter...Usit.

Most plausibly, the events of (40a) are simultaneous, whereas the most plausible reading of (40b) presents overlapping events. The contrast is similar to that presented above for French.

I now show that not all viewpoint interpretations are available for LVM sentences. Consider the possible range of imperfective viewpoints. Imperfectives in French and other languages often focus the preliminary stages of a situation, especially situations of the Achievement type. We might predict, therefore, that LVM sentences in French would have such an interpretation. But the prediction is not borne out. Consider Achievement clauses in the *Futur*. If the preliminary reading were available for them, it should be reasonable to conjoin such *Futur* Achievement with assertions that the events will not actually occur. (41) illustrates; the translations are only approximate.

(41) a. La guerre éclaira.
The war will break/be breaking out.
b. # La guerre éclaira mais elle n'éclaira pas.
The war will be breaking out Fut but it won't break out Fut.

a' Le cheval gagnera.
The horse will win/be winning.
b' # Le cheval gagnera le course mais il ne gagnera pas.
The horse will be winning the race Fut but he won't win Fut.

The conjunctions are ill-formed. Similar examples can be constructed for Navajo, in which the future tense has no viewpoint morpheme. (42), for instance, does not have the preliminary interpretation in which the subject is about to kick the ball.

(42) 'yíitał.
He is kicking it (e.g., ball) Fut.

The question of such readings does not arise for Chinese, because the imperfective never focuses preliminary stages.

The examples show that neutral viewpoints are not entirely flexible: they do not focus the preliminary stages of a situation. This finding suggests a strong and interesting prediction. The prediction is that LVM sentences do not have marked viewpoint interpretations: in other words, that such sentences do not have a span beyond the endpoints of a situation.

This prediction might be tested for resultatives, intervals following the final endpoint of an event. There are viewpoints that focus such intervals: the imperfective resultative in Chinese and English, and the *-guo* perfective in Chinese. We would like to know whether the post-event focus is possible for LVM sentences. Since English does not have LVM sentences, the question arises only for Chinese. Unfortunately we cannot conclusively test the prediction for either marked case in Chinese. Resultatives cannot be reliably distinguished from statives, because the relevant verb constellations are morphologically indeterminate. The *-guo* perfective is problematic in a different way. The viewpoint requires a discontinuity between the resultant state of a situation and a subsequent time. But a discontinuity may be inferred in the absence of information to the contrary. Thus inference from lack of information may always allow a discontinuity interpretation for LVM sentences. The prediction concerning marked viewpoint spans must be studied with other languages that have the relevant structures.

I have shown that LVM sentences may have open and closed, but not preliminary interpretations. The temporal schema of the neutral viewpoint accounts for the range of interpretations that occurs. It also provides every sentence with an aspectual viewpoint. This theory-internal requirement has the advantage of extending the scope of the general account to languages like Finnish and Eskimo, which do not have explicit viewpoint morphemes. Neither Finnish nor Icelandic has grammaticized viewpoints, although there are optional lexical means for giving information about point of view (Heinämäki 1983, Fortescue 1984). The limitations on neutral viewpoint interpretations hold for these languages. For instance, in Finnish and Eskimo, the interpretation of Achievement sentences cannot involve preliminary stages of an Achievement without explicit lexical support. The same is true for Finnish.[8]

The neutral viewpoint allows both open and closed readings. Its span includes the initial point and at least one internal stage of a situation (where relevant). The temporal schema is presented in (43):

(43) Neutral Viewpoint Temporal Schema: I.

The neutral viewpoint complements the other viewpoints in the amount of information it makes visible about an event. The neutral viewpoint includes one endpoint, the perfective both endpoints, the imperfective neither. Thus unlike the imperfective the neutral viewpoint allows closed readings by inference.

The neutral viewpoints investigated here have the same range of interpretation. However, there might be differences in the neutral viewpoints of other languages. This is a subject for future research.

4.3 The Independance of Viewpoint and Situation Type

In this section I will show that the components of situation type and viewpoint are independent. The discussion brings out several advantages of the two-component theory, which has thus far been assumed without argument.

4.3.1 Viewpoint span

The first argument for the independence of the components comes from the possible span of an aspectual viewpoint. There are a number of viewpoints whose span does not coincide with a situation, as we have seen. To account for such viewpoints with-

out incoherence the viewpoint of the sentence must be independent of the situation schema. The relevant viewpoints have already been introduced; I bring them together here to make the theoretical point.

Imperfective viewpoints may have a span that does not coincide with the temporal schema of a situation. For instance, the progressive may focus the preliminary stages of an Achievement, as in (44).

(44) a. Algernon is reaching the top.
b. "Bright Star" is winning the race.

In these sentences, the viewpoint focuses an interval that is preliminary to the single stage of an Achievement event. The event itself is not included in the span of the viewpoint. This type of imperfective sentence appears in many languages, as we have seen.

Similarly, the viewpoints of resultative sentences have a span that does not include the event schema. Resultatives have an imperfective viewpoint that focuses a resultant interval of a telic event. Such sentences are common in Mandarin Chinese, for instance. (45) gives a Mandarin example with the stative imperfective viewpoint, indicated by *-zhe* on the verb.

(45) Zhangsan zai chuang shang tang-zhe
Zhangsan at bed on lie-ZHE
Zhangsan is lying on the bed

Resultatives appear in many languages.

Important evidence for the independence of the components comes from the analysis of another Chinese viewpoint, the perfective *guo* , known as the experiential. The experiential *-guo* asserts a discontinuity between the final endpoint of the prior situation and the current state of affairs, as shown above. To see how it differs from the span of the standard perfective, compare the sentences in (46), a *-guo* perfective and a *-le* perfective:

(46) a. Tamen shang ge yue qu-le Xiang Gang.
they last CL month go-LE Hong Kong
Last month they went to Hong Kong (they may still be there)

b. Tamen shang ge yue qu-guo Xiang Gang.
they last CL month go-GUO Hong Kong
Last month they went to Hong Kong (they are no longer there)

(46a) with perfective *-le*, simply asserts that the event of going occurred; (46b), the *-guo* perfective, also asserts that the result state of the event, if transitory, no longer obtains. The sentences are appropriate in different situations. The perfective with *-le* is felicitous whether or not the subjects are still in Hong Kong; but the perfective with *-guo* can be said only if they are no longer there.

The *-guo* viewpoint presents a closed situation with a change of state subsequent to the final endpoint. In terms of a situation type schema, the span must include the

prior situation and a post-final stage not part of the situation itself. This span cannot be stated coherently as dependent on the situation schema.

Viewpoints with a span that does not coincide with the situation schema are not uncommon, as the examples show. Because viewpoint is independent of situation type the two-component theory can account nicely for the preliminary interpretation of Achievements, the resultative interpretation of telic events, and the discontinuity of the Chinese experiential.

4.3.2 Visible information and the imperfective paradox:

Situation type is transparent to the receiver whatever the viewpoint of a sentence. This constitutes another argument for the independence of the aspectual components. Consider a familiar example, a sentence with the progressive viewpoint:

(47) a. We were walking to school.
b. Composite temporal schema: $I\,..///..\,F_{Nat}$.

Receivers of this sentence know that only part of the event is semantically visible. But they also know what sort of event it is: [we talk to school] is telic, with a natural final endpoint. More precisely, situation type information is always semantically visible in a sentence. The verb constellation conveys the nature of the final endpoint, although the final endpoint is not visible in the sentence and may never occur. This is represented in the composite temporal schema (47b), which contains information about viewpoint and situation type.

The composite schema correctly represents what the sentence conveys about viewpoint and situation type, I believe. Such knowledge has been called paradoxical. Indeed, the understanding of progressives is said to involve an 'imperfective paradox' (Dowty 1977).[9]

In the two-component theory there is nothing paradoxical in the knowledge that the receiver has about (47). Situation type and viewpoint belong to independent components of the aspectual system, and are signalled differently. Viewpoint is conveyed by a single morpheme; the constellation of a verb and its arguments conveys situation type. The linguistic forms do not contrast syntactically.

Note that the same sort of knowledge is assumed without qualms for the interpretation of progressive atelic sentences such as *Mary was swimming in the pond.* Knowing that an Activity has an arbitrary final endpoint relies on information about the type of situation. The case is really the same for any sentence that presents part of a situation: it is not limited to sentences of telic situation types.

The information about situation type is intensional information about an ongoing situation. It is difficult to implement this kind of intensional knowledge in a truth-conditional account. The problem, I take it, is to recognize that a fraction of an event belongs to a larger event. In fact we make such conclusions all the time on the basis of partial knowledge. If I see Jane walking along a certain street early in the morning, I may think that she is walking to school. If I see that she is carrying her briefcase, my hypothesis will be strengthened. Of course I may be wrong. The point is that people often categorize events without full, conclusive evidence of their nature.

My ability to correctly assess the situation of Jane walking down the street will depend on my knowledge of events and of Jane's habits, and it is quite independent of my inability to predict the future. I cannot know that Jane will run into Mary, who is playing hookey, and decide not to go to school after all; or, in another scenario, that she will be run over by a truck. Undoubtedly certain events in progress are less easy to recognize than Mary walking to school. One may sometimes be mistaken, one may sometimes be in ignorance.

Similarly, we frequently categorize objects on the basis of partial knowledge. Suppose that I see a railroad car in front of me at the railroad station, but can't see anything else. I may assume that other railroad cars are behind it, and say that I have seen part of a train. If the railroad car was actually sitting alone on the track I have made an incorrect identification, due to the fact that I had only partial information. These problems belong to a different discussion, and arise for any intensional account of ongoing situations.

4.3.3 The relation between statives and imperfectives

I will now discuss a vexed question in the semantics of aspect, the relation between statives and progressives. The two are similar intuitively and formally: the question is whether they belong to the same aspectual category. I will show that progressives differ in several ways from statives. Therefore, I argue, they should not be collapsed into one global category. The argument strengthens the case for the independence of the components.

There is an interesting similarity between stative sentences, which have the perfective viewpoint, and sentences with the progressive viewpoint. They share certain properties and have similar effects in discourse. Both present open situations, without endpoints. Intuitively both stative and progressive sentences present stable situations, although progressives have successive stages and statives do not. The interval focused by a progressive is a process; and processes are very like states. Processes may seem unchanging, although they have successive stages. With no end in view the stages of an event, even a telic event, may seem merely to succeed each other in time. The factor of dynamism may seem to be the only difference between a state and a process.

Formally, progressive sentences and stative sentences both have the subinterval property and the pattern of entailment associated with it. Just as *John has loved Mary from t_i to t_k* entails *John loved Mary at t_j*, so *John has been running from t_i to t_k* entails *John was running at tj,* where t_j refers to any of the infinity of points or intervals between t_i and t_k. The fact that imperfectives have the subinterval property may be expressed formally with the notion of a larger interval. Dowty provides for this in truth conditions for progressive sentences, reproduced here as (49).

(49) The progressive of a sentence S is true at interval I if there is an interval I' properly containing I such that S is true at I.

Dowty shows that it follows from this definition that any sentence with the progressive has the subinterval property (1986:44 et seq).

There is also a distributional relation between progressive sentences and sentences associated with the stative situation type. They complement each other, since the progressive is available neutrally only to non-statives. This complementarity, and the fact that both types of sentence have the sub-interval property, may suggest that progressives are statives. In fact the progressive has been analyzed as a stative operator (Taylor 1977, Vlach 1981). But the analysis must be rejected on both conceptual and empirical grounds.

There are several empirical arguments against identifying progressives with statives. If we look at imperfective viewpoints in other languages, we find that there is no inherent complementarity between the imperfective and the stative. The imperfective viewpoints of French and Russian apply to stative sentences, for instance. And the two imperfective viewpoints of Chinese (*zai* and *-zhe*) differ precisely in the property of stativity, as we have seen.

Statives are linguistically distinct from progressives in Chinese and English. Statives are more flexible than progressives: they may be taken as open or closed informationally, whereas progressives are never closed. Sentences with *when*-clauses show this difference. Compare the interpretations of (50a-b).

(50) a. Mary was angry when John broke the glass.
b. Mary was singing when John broke the glass.

(50a), a stative, is ambiguous: either Mary was already angry before the event of the main clause, or she became angry at the time of the event. (50b), a progressive, has only the ongoing interpretation.

Although the progressive is not neutrally available for statives, progressive stative sentences occur, particularly in informal discourse, as we have seen. (51) give some additional examples:

(51) a. John was really liking the play.
b. That cake is looking done.
c. Amy is resembling her great-uncle today.

In these examples stative verb constellations appear with the linguistic forms appropriate for events, endowing them with the dynamism and other connotations of events Marked choice of the progressive is a live and much-used option in the language. If progressives are identified with statives, we cannot explain the distinction between standard and marked progressives.

Empirically, then, there is strong evidence against identifying progressives with statives. The information conveyed by statives and progressive is similar in some ways, as we have seen; but it arises differently. Sentences with the progressive are open informationally because the progressive does not include the endpoints of an event. Stative sentences present situations which do not have endpoints in their temporal schema. Strikingly, they play similar roles in narrative discourse. Neither type of sentence tends to move narrative time.

Conceptually the two are of different types. Progressives are a type of imperfec-

tive viewpoint; they are very like statives because they have properties in common; but they are not statives. In the two component theory one is associated with an idealized situation type, while the other is a viewpoint. Although they share the subinterval property, they are not of the same category.

As a final point, I note that situation type shifts also suggest the independence of viewpoint and situation type. I showed in Chapter 3 that there are several triggers for shifts in situation type. The triggers include viewpoints, and adverbials. The shifts are analyzed in a simple manner, in which viewpoints are not accorded privileged status.

In conclusion, I have adduced evidence of several kinds in support of the claim that the components of viewpoint and situation type are independent.

4.4 Viewpoints and Conventions of Use

The aspectual meanings conveyed by a sentence include emphasis and information arrived at by inference. These are pragmatic meanings, dependent on context and convention. They complement the semantic meanings associated with linguistic forms. The pragmatic meanings associated with a viewpoint are guided by conventions of use. The conventions depend partly on general cooperative principles of inference and partly on the pattern of a particular language.

4.4.1 Pragmatic conventions and closed systems

Pragmatic meanings will be stated at a separate, interpretive level in the formal account of aspect. This allows us to maintain the analysis of semantic invariance for aspectual viewpoints. Divergent interpretations of a viewpoint are explained by different inferences and conventions of use. We predict the interpretations on the basis of conventions associated with the viewpoints and basic patterns of inference, which are assumed cooperatively by speakers and receivers.

Viewpoint conventions depend in part on the aspectual contrasts that a language makes available. If only one viewpoint is generally available, that viewpoint is pragmatically dominant in the language. In Russian the imperfective viewpoint is dominant: The imperfective is used for all situation types, while the perfective appears only with non-statives. The conventions associated with each viewpoint are partly related to this contrast. The Russian imperfective has several conventional meanings, each with a different emphasis. The Russian perfective has fewer possibilities. This is not surprising since the perfective is the more specific and therefore more limited of the two (in Prague School terms, the perfective is marked). The conventions are discussed below, and in Chapter 10.

The main factors that shape the conventions of use are the place of a viewpoint in the aspectual system and the information it conveys. Use of a viewpoint in a certain conventional pattern depends on context and the mutual knowledge that obtains between speaker and receiver. When conventions conflict, contextual information often suggests which convention overridees the other. Precisely when one interpretation or another is intended and conveyed is a delicate matter; in this discussion I can only identify factors that play a role in aspectual interpretation.

4.4.2 Augmented interpretation

The aspectual interpretation of a sentence may be direct, using the information that is semantically visible. Interpretation may also be augmented with additional information arrived at by inference. An augmented interpretation contains information that is not due to the linguistic forms of the sentence. For instance, the receiver of (52) might infer that the final endpoint of the event has occurred, even though no endpoints are semantically visible.

(52) John and Carolyn were painting the house.

Making such an inference, the receiver may add a final endpoint to their representation of the information conveyed by the sentence. Augmentation is often licensed by information in the context, for instance, a later sentence may assume that the house in question in (52) is completely painted. Receivers may have independent knowledge about a situation, or pragmatic information about the world which makes a given interpretation plausible. The absence of information that contradicts an augmented interpretation is also a factor. The notion of augmentation distinguishes interpretations that depend on inference from those that arise from semantic meaning only.

The typical augmentation for sentences with an imperfective viewpoints is the addition of endpoints to the interpretation. If situation is in progress, it follows that the situation has begun. Thus an imperfective sentence presenting a durative situation entails an initial endpoint. And if context and knowledge warrant, the receiver may infer the final endpoint of the ongoing situation. The inferences about endpoints hold for sentences with a neutral viewpoint, which are also open informationally. The perfective typically leads to inference that the final state continues (for telic events).

We want the information that arises through inference to appear in the formal representation of a sentence, yet to be distinct from semantically licensed information. There are practical reasons for keeping the two kinds of information separate. Later sentences may give other facts or inferences that lead to revision of an inference about a sentence. For instance, a sentence following (52) might say that John and Carolyn never finished the painting job. If one had assumed a final endpoint for (52), one would revise the assumption after interpreting the later sentence. Further, other types of pragmatic inferences arise in sentence interpretation and should probably be treated together in a formal representation. Thus if there is reason to infer a final endpoint, continuing result, or other feature for a sentence, these features will appear in an augmented Discourse Representation Structure for that sentence; see Chapter 7.

In working out the inferences available for a given sentence it is essential to assess the factor of mutual knowledge. Suppose that Bill and Sue embark on the building of a gazebo, and they finish building it before the week's end. I can truthfully talk about the event with either of the sentences of (53). The question is which one I should use in conversation with another person, you for instance.

(53) a. Bill and Sue were building a gazebo last week.
b. Bill and Sue built a gazebo last week.

The answer to the question depends on the information that both have about the situation, and our mutual knowledge. (53a) is appropriate if you know that the gazebo was finished, but it would be misleading for me to use it otherwise. The reason: if you don't know the outcome of the situation, my choice of the imperfective might lead you to think that the Accomplishment did not reach its natural final endpoint. Thus (53b) is more appropriate if you and I do not have mutual knowledge of the situation; see the collection of papers in N. Smith 1982 for a discussion of mutual knowledge.

Generally, if a closed viewpoint is warranted by circumstance, the open viewpoint will be too. The speaker may choose between them if the language and the state of mutual knowledge allow. Choice of the perfective viewpoint gives positive emphasis to the final endpoint, and may suggest its continuing result. The imperfective gives positive emphasis to the ongoing situation. Whether the receiver knows the circumstances is crucial. If the speaker has no knowledge of the situation, use of the imperfective viewpoint may convey that the final point did not occur. I assume truthfulness on the part of the speaker; if only the open viewpoint is warranted by the actual situation, no choice is available to the speaker.

4.3.3 Conventions of use for aspectual viewpoints

The information conveyed by aspectual viewpoint may be interpreted positively or negatively. Positive emphasis draws attention to the information made visible by the viewpoint. With positive emphasis, an imperfective sentence like (52) presents the fact of the ongoing house-painting. Negative emphasis, in contrast, draws attention to what is not visible. With negative emphasis, (52) draws attention to the absent endpoints of the house-painting event. These differences are reminiscent of the Prague School insights about contrastive meaning. The conventions that I present below draw on the possibility of different emphasis for sentence.

Two different discourse principles underlie most cases of pragmatic emphasis. They are the principles of minimality and of maximality.[10] By the principle of minimality, speakers say only as much as they need to say: this leads to an understanding of positive emphasis. There is also a principle of maximality. According to the maximality principle, speakers say as much as they can say. This leads to an understanding of negative emphasis.

There are strikingly consistent uses of the aspectual viewpoints across languages. The same conventions appear in languages of very different structures and in many types of discourse. The consistency is due to the similar information that the viewpoints present and the contrastive nature of viewpoint choices. In this section I mention several conventions that are commonly associated with the viewpoints. What is conveyed in a given case depends also on mutual knowledge and the structure of the language.

Imperfective viewpoints: Sentences with an imperfective viewpoint may have a positive or a negative emphasis, as noted above. Consider another example of the English progressive:

(54) Mildred was shelling the peas.

This sentence presents an internal interval of the situation. Taken positively, the sentence emphasizes the fact that the event [Mildred shell the peas] was in progress. I will call this the Ongoing Event Convention. The negative interpretation emphasizes instead that the sentence presents an open event, inviting the inference that the final endpoint of the situation has not occurred. This is the Convention of Incompleteness. With a negative emphasis (54) suggests that Mildred did not finish shelling the peas.

There is also an interpretation (of 54) which emphasizes the fact that pea-shelling has occurred. There is a well-known convention for Russian, the Statement of Fact Convention, which has this force. Russian speakers often use it in choosing the imperfective viewpoint to talk about an event that has already occurred. Often the event has a known final endpoint. (55) is a famous example:

(55) *Vojnu i mir* pisal Lev Tolstoj.
Lev Tolstoj wrote^{Impf} *War and Peace*

This use of the imperfective does not mislead the receiver into concluding that Tolstoy did not complete the novel or that the speaker is describing the action in progress. Rather, (55) emphasizes the event itself. If the perfective viewpoint were used the emphasis would be on the completion of the event. Other Russian conventions of interpretation for the viewpoints are discussed in Chapter 10.

Another use of the imperfective is noted with some interesting French examples in Ducrot 1979. The *Imparfait* is a past tense that conveys the imperfective viewpoint. There is a marked, conventional use in which the speaker presents a situation with the *Imparfait* although its endpoints are mentioned, or are known pragmatically. As Ducrot notes, the situation is presented as continuous throughout the interval, and interpreted as a characterization of the interval. (56) presents two of Ducrot's examples:

(56) a. C'est incroyable, le semaine dernière il pleuvait plusiers fois.
et, cette semaine, il n'y a pas eu une goutte d'eau.
It's amazing, last week it rained^{Impf} several times but this week.
there hasn't been a drop of water.

b. L'année dernière je démenagais.
Last year I moved^{Impf}.

In (56a) the several rainfalls are presented as covering the entire week; in (56b) the event moving is presented as taking up the whole year. The force of these sentences is to characterize the time intervals by the events talked about. The convention implicitly invoked may be called the Characterizing Convention. As Ducrot notes, this is an extension of a standard meaning: the *Imparfait* typically ascribes a property to a situation for a continuing period.

The imperfective is frequently used to present a situation as a temporal frame for

an event. The open, ongoing situation provides a background against which the second takes place. Otto Jespersen discussed this use lucidly for the English progressive. (57) is his example: he argues that it requires a context to be fully interpreted.

(57) He is hunting.

Jespersen explains the temporal meaning of the progressive in this sentence as follows: "The hunting is felt to be a kind of time frame around something else; it is represented as lasting some time before and possibly (or probably) also some time after something else, which may or may not be expressly indicated, but which is always in the mind of the speaker . . . if we say (57) we mean that the hunting (which may be completed by now) had begun, but was not completed at the time mentioned or implied in the sentence, and this element of incompleteness is very important" (1931:179). In other words, the main event is located temporally by its occurrence in the middle of some other, protracted, process.

Imperfective sentences often seem incomplete in isolation, although they are not ungrammatical. Native speakers sometimes reject them when they are presented out of context. The sense of incompleteness is due to the fact that imperfectives give only partial information. (57) is not complete informationally unless the "something else" which Jespersen invokes is explicit elsewhere, or is independently known. Information is needed that can anchor the situation, allowing the receiver a more complete temporal understanding. Since we cannot identify the referent of the pronoun, this example is incomplete in another way as well.

Present imperfectives are anchored to the moment of speech, so that a context for understanding them can often easily be provided by the receiver. Past and future imperfectives are more difficult to interpret in isolation. They often appear with temporal adverbials which provide such an anchor, as in (58):

(58) a. Michael was sleeping.
b. Michael was sleeping when the gong rang.
c. At noon, Michael was sleeping.

(58 b, c) have temporal anchors and are better in isolation than (58a). More generally, sentences with imperfective viewpoints are often dependent on other information in the manner typical of anaphora; see Partee 1973, 1984; and Westfall 1995 on temporal anchoring and the progressive. The partial information given by imperfectives, and the fact that they are frequently used for backgrounding, conspire to produce this effect.

There is often a strong connection between the imperfective viewpoint and the irrealis modality. The imperfective-irrealis connection appears in counterfactual conditionals, for instance, as in the following French example from Fleischman 1995.

(59) Si j'avais le temps, je t'écrirais.
If I had[Impf] time, I would write[Cond't'l] to you.

Other contexts in which imperfective viewpoints are associated with the irrealis mode are discussed in Fleischman 1995.

This is by no means an exhaustive account of the pragmatic meanings associated with imperfective viewpoints; see the discussions in Part II for some other cases.

Perfective viewpoints: Sentences with the perfective viewpoint may have a positive or a neutral emphasis. Positive emphasis for perfectives draws attention to the actual completion of an event. This understanding is salient in Russian, with a convention of Final Emphasis. (60) illustrates, with a telic and an atelic example:

(60) a. On vstal ran'še vsex.
He got up[Perf] before everybody else.

b. On mne pomog vo vremja moej učeby.
He helped[Perf] me during my studies.

The perfective viewpoint also conveys neutral emphasis when the event itself is of interest, as in the context of a sequence of events.

The perfective may invite the inference that the final or resulting situation continues. The convention of Continuing Result is common. The example illustrates with a Russian sentence:

(61) a. K vam kto-to prišel.
Someone has come[Perf] for you (and is still here).

Aspectual viewpoints are salient in Russian, and the conventions of use play an important role in the language.

The inference of Continuing Result is commonly used with inceptives. When an inceptive sentence has the perfective viewpoint it is plausible to infer that the situation continues. This is particularly natural with super-lexical morphemes such as *begin*. (62) illustrates for Navajo and English:

(62) a. bi'niiłgaii.
I finished[Perf] starting to heat it.
b. Tania began to talk.
c. Sonia started to walk away.

Continuing Result is a strong convention in Navajo. It is particularly frequent for inceptives. (62a), for instance, would be used to convey that the speaker is now in the process of heating it; see Chapter 12.

Since there are conventions for positive, negative, and neutral emphasis, it is often necessary to choose between competing conventions when one interprets a given sentence. Competing conventions are discussed in connection with Russian, in Chapter 10.

4.4.4 *Narrative conventions and the viewpoints*

Perfectives often function in narrative discourse to move things forward, because the endpoints of events are presented explicitly. "The expression of a sequence of actions is one of the most characteristic functions of perfective verbs in an extended context" (Forsyth 1970: 9-10). Advancing the plot is perhaps the most basic use of perfectives in narrative. It has been documented extensively for many languages, including French, Navajo, Inuktit, Indonesian, Malay, Greek (see the preface and articles in Hopper 1972).

In narratives, imperfective sentences may present situations that provide a background for the main events. They present open situations, not closed events which move the narrative forward; Labov & Wiletzky 1967, Weinrich 1973, Hopper 1982. More specifically, imperfective sentences tend to provide descriptions and other information, and they present situations that are simultaneous with the main events (Midgette 1987:107). Backgrounded information "does not immediately and crucially contribute to the speaker's goal, but . . . assists, amplifies, or comments on it" (Hopper & Thompson, 1980:280). Imperfectives are said to have a backgrounding function.

However, an analysis in terms of backgrounding threatens to be too simple: discourse does not consist of a foreground and background, deployed in an entirely straightforward manner. To do justice to the features of discourse, including use of aspectual viewpoints, a more complex view is necessary. Waugh & Monville-Burston discuss the complexity of discourse with a metaphor of density: " . . . imagine a text as a dense construction.(it has) levels of different depth: foreground of narration vs background of description and commentary; level of the general vs level of the particular; surface of the text vs. projected elements (in high or low relief) which stand out; basic configuration of the text in the recesses of which one finds subordinated elements; dominant lines of development vs secondary or even subsidiary shunted elements" (1986: 873). This correctly suggests that imperfectives may function differently in different narrative contexts.

Conventions of narrative, like other conventions, can be flouted. In a narrative the imperfective can be used to move events forward, since it entails the beginning of the situation in question. This is a marked use that occurs with some frequency. It flouts the convention that imperfectives do not move narrative time forward. The following example illustrates in French, from a short story by Gustave Flaubert, *Un Coeur Simple*:

(63) Elle résolut de le porter elle-même à Honfleur. Les pommiers sans feuilles se succédaient au bord de la route.

She decided to take it herself to Honfleur. There were apple trees without leaves lining[Impf] the highway.

In the first sentence, a perfective, we are told through the implicature of ***résolut*** (decided) that the protagonist of the story, Félicité, will go to the nearby town of Honfleur. The next sentence is imperfective, a stative that describes the highway. The reader understands that the highway goes to Honfleur, and that the narrative has moved forward to the middle of Félicité's journey. Here the descriptive, imperfective sentence serves to advance the narrative (Whitaker & Smith 1985: 263). There are other ways in which the imperfective used for foregrounded information. For instance, in some Navajo narratives the progressive is the viewpoint of choice to present foregrounded events that are simultaneous with other events (Midgette 1987:104-150).

Imperfectives may also be used contrastively to present foregrounded events. There is a well-known convention for such a use of the French imperfective past tense, the *Imparfait*. By this convention, known as the *Imparfait de Rupture*, an imperfective sentence terminates a discourse or an episode told in a perfective tense. For instance, in the following example all sentences but the last have the perfective viewpoint:

(64) Elle s'arrêta un instant. Elle consulta un petit carnet de notes, leva la tête, regarda et continua son trajet. Arrivée à la dernière rangée, elle s'engagea sur l'herbe mouilée. Elle se penchait sur chaque croix et lisait les noms.

She stopped for a moment. She consulted a small notebook, raised her head, looked around, and went on. When she arrived at the last row, she got down on the wet grass. She bent[Impf] toward each of the crosses and read[Impf] the names.

(Arnothu; Tasmowski-De Ryck 1985:73).

The last sentence is in the *Imparfait*. In this conventional use of the imperfective viewpoint, the contrast between aspectual viewpoints plays a significant role.

I conclude with a cautionary example which shows the importance of conventions of use. If speakers do not know the relevant convention of use, they may fail to convey the meaning they intend. I give an example of such a failure for a Russian imperfective sentence with an Achievement verb constellation. This type of sentence is often indeterminate, with a single-event reading and an habitual reading. In Russian the habitual reading is basic; convention requires adverbial support to convey the single event reading. (65) was produced by a student of the Russian language. It was intended to present the preliminary stages of a single event, an Achievement.

(65) Ja privykal k vašemu klimatu. (Imperfective)
I was in the process of adjusting to the climate here.

But for Russian speakers, (65) has the only habitual reading . It does not convey that preliminaries are in progress: convention requires adverbials for such an interpretation. "The foreign student may use (64) intending to express action in progress but eliminating all adverbial modifiers of that action. The utterance is incomplete, inadequate for conveying the intended meaning. Some contextual element is needed . . . " (Rassudova 1977:141, cited in Brecht 1984). Unfortunately, the foreign student who constructed (65) did not follow the convention requiring contextual support in such cases.

The web of conventions that support discourse of all kinds must be taken into account in constructing a sentence, and interpreting aspectual meaning. Contextual and other pragmatic cues help the user to select the appropriate convention. The conventions are required because of the many-one relation between forms and meanings: a limited number of linguistic forms and semantic meanings are used by speakers to convey many different pragmatic meanings.

Notes

[1] Chomsky explains the acquisition of parameters as follows. "The principles of UG have certain parameters, which can be fixed by experience in one or another way. We may think of the language faculty as a complex and intricate network of some sort associated with a switch box that can be in one of two positions. Unless the switches are set one way or another, the system does not function. When they are set in one of the permissible ways, then the system functions in accordance with its nature, but differently, dependencing on how the switches are set. The fixed network is the system of principles of universal grammar; the switches are the parameters to be fixed by experience. Acquisition of a language is in part a process of setting the switches one way or another on the basis of the presented data, a process of fixing the values of the parameters " (Chomsky 1988:63).

[2] As I note in the Introduction, the relation between viewpoint and situation type, while familiar to scholars, has rarely been studied in a systematic manner. In several recent formal semantics treatments of English the progressive viewpoint is analyzed as an operator on situation type (Dowty 1979,Vlach 1980); it is not clear whether they regard the perfective viewpoint as basic or also as an operator. Hoepelman 1978, Brecht 1984, Timberlake 1982, analyze the perfective and imperfective viewpoints of Russian as operators. There are other similar approaches in the literature.

[3] Lyons 1977 presents an introduction to the contrasts among viewpoints. The contrasts are sometimes expressed as sets of features in formal opposition, e.g. punctual (closed)-durative (open), complete-incomplete, either one of which may subcategorize the other, and stative-non-stative (Friedrich 1974:S35). In each pair the first property is generally characteristic of the perfective viewpoint, the second is characteristic of the imperfective. Thus the aspectual system of a language may be characterized by the main oppositions of its viewpoint system. Friedrich proposes that the basic opposition of Slavic is complete-incomplete, while that of Homeric Greek is durative-nondurative. For other points of view on Slavic, see Forsyth 1970 and the references of Chapter 10.

[4] Dense time contrasts with discrete time, which may consists of maximally small moments. In dense time, no smallest unit occurs: for any two moments, there is in principle always another moment between them. The notion that time is dense has been adopted by many scholars, including Taylor (1977), Kamp (1989). There is a procedure for converting discrete to dense time, suggesting that the distinction between them may not be of great significance (Dowty 1979: 76).

[5] The Neutral viewpoint is a default in the languages studied here, because it arises only in the absence of an overt viewpoint morpheme. However, in principle a language might have a neutral viewpoint that contrasted with perfectives and imperfectives. I would like to thank Haihua Pan for helpful discussion of this point.

[6] The French tense-viewpoint system has a present tense and a future tense, which do not convey aspectual viewpoint. There is a set of past tenses which differ in viewpoint; see Chapter 9.

[7] The Chinese neutral viewpoint represents a choice when it appears with non-stative sentences; statives require the neutral viewpoint.

[8] I would like to thank Orvokki Heinämäki and Tony Woodbury for helpful discussions of Finnish and Icelandic, respectively.

[9] For discussion of the so-called imperfective paradox see Dowty 1977, Vlach 1981. The approach presented here is an intensional one: it depends on the notion of the telic property as intensional when it holds of a situation type. Parsons 1988 presents a similar view. Recently Dowty has argued that the imperfective paradox can only be resolved with an intensional treatment of some kind (at a conference on Events at the University of Texas, 1988).

[10] Minimality and maximality are discussed in connection with the conversational principles of Grice in Levinson 1987.

CHAPTER 5

TEMPORAL LOCATION

5.1 Time and Temporal Location

Temporal information in a sentence locates a situation in time. For instance, (1) informs us that the atelic durative event [Algernon ran in the park] occurred at a time one day prior to the time of speech, for the interval of an hour.

(1) Algernon ran in the park for an hour yesterday.

The information is given by the past tense and time adverbial. The tense locates the event relative to the time of speech, a truth-conditional matter. It also establishes the past as the temporal standpoint of the sentence, a conceptual matter. The adverbial further specifies the time of the event. The systematic way in which this information is conveyed, and the interaction of temporal location with aspect, is the topic of this Chapter.[1] The discussion is confined to tensed sentences, and is intended only as an introduction to a complex domain. It presents the essentials needed to understand the interaction of aspect with temporal location, and to formalize the semantic information in the framework of Discourse Representation Theory.

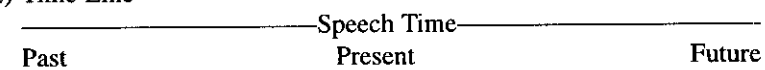
Temporal location and aspect are complementary temporal systems. The former locates a situation in time, while the latter specifies the internal temporal structure of the situation. The expression of temporal location is intertwined morphologically with aspect in many languages of the world. This morphological connection expresses a deeper relation. We know already that there are co-occurrence relations between temporal adverbials and verb constellations of different situation types; and that adverbials may affect the situation type of a verb constellation. There are other connections between aspect and temporal location.

The feature of duration plays a direct role in both domains. Durative (atelic) and

occur at intervals, and sentences must be evaluated at intervals. Such intervals cannot always be reduced to conjunctions of instants. Indeed, intervals are the basic unit for temporal location (Bennett & Partee 1972, Dowty 1979). There are other ways in which duration affects both domains. The conceptual properties of an event are visible only as it unfolds in time, as I show in Chapter 6. And finally, the temporal interval needed for locating a situation provides a bridge that allows the formal realization of viewpoint and situation type as independent (Chapter 7). Thus aspect and temporal location are related both notionally and formally.

Time is a single, unbounded dimension. Conceptually it is analogous to space. Just as an orientation point is needed to locate positions in space, so an orientation time is needed to locate situations in time. In language the basic orientation point is the time of utterance, which is always the Present. (I use capital letters to refer to times, lower case to refer to particular tenses.) Time may be represented as a straight line stretching in both directions from the moment of speech, or Speech Time. (2) presents a time line; the Past is leftward of Speech Time and the Future is rightward.

(2) Time Line



Times and situations are located at moments or intervals relative to Speech Time. Since the dimension of time is a single one there are relatively few possible relations between situations. Situations may occur in sequence or they may overlap, wholly or in part. "If two events can be said to take place at different times, it is uniquely and necessarily the case that one of them is earlier, the other is later" (Fillmore 1971:28). In deriving the basic notions of time, situations can be taken as basic and a temporal system developed according to the relations between them (Kamp 1979:382, Bach 1980:29).

Tense and adverbials together indicate temporal location. Tense is a grammatical category, indicated verbally, that presents "a grammaticized expression of location in time" according to Comrie (1986:9). The definition of tense must account for the fact that verbal inflection, verbal auxiliaries, and periphrastic verbal expressions may all function to convey temporal location. Indeed, there are "frequent cases of . . . the functional equivalence of . . . syntactically and morphologically expressed categories across languages and even in one language—as in the Latin Perfect tenses which are inflectional in the active voice but periphrastic in the passive" (Dahl 1985:22).[2] While recognizing these difficulties, we shall say that tense is a grammatical category, a set of verbal inflections or other verbal forms, that expresses a temporal relation to an orientation point.

Speech Time is the basic orientation center in language for temporal location, as on the time line above. Tense is often 'deictic': oriented to Speech Time. Tense systems vary considerably; see Comrie 1986. Some languages have tenses that indicate past, present and future; others have a tense distinction between past and non-past, still others have a distinction between present and non-present. Some languages, e.g. Mandarin Chinese, Malay, Thai, Classical Hebrew, do not have the grammatical category of tense. For these languages temporal location is expressed directly by adverbials, and indirectly by the use of aspectual viewpoint.

In languages with no tense, the aspectual viewpoints have consistent temporal location interpretations. The imperfective viewpoint is used neutrally to talk about the present, while the perfective viewpoint is used neutrally to talk about the past. Temporal adverbials or other information may override these default conventions of understanding. See the discussion of conventions of use for Chinese and Navajo, neither of which has a tense distinction between the present and the past.

Temporal adverbials locate situations by relating them to times or to other situations. Locating adverbials require an orientation time, as do tenses and other locating forms. These adverbials may be classified as deictic, anaphoric, or referential, according to type of orientation. Deictic adverbials are oriented to the moment of speech: *now, last Thursday,* etc. Anaphoric adverbials orient to a previously established time: *then, at that time,* etc., and referential adverbials refer to a time established by clock or calendar: *April 23, 2 am.* Duration and frequency are also specified by adverbials.

There are two prevailing spatial metaphors for time that appear in language. In one the world is constant and time goes by, as a river flows past a bystander on a beach. The past leads: it is ahead and the future is behind. This is the Moving Time metaphor. In the other, the Moving Ego metaphor, the world moves through time toward the future: the future is ahead on the highway of time, the past is behind (Clark 1971:50 et seq). Many languages, including English, have expressions based on both of these metaphors. For instance, compare *in the months ahead* and *in the following months*: both expressions mean the same thing but one puts later time ahead, the other puts later time behind (Fillmore 1971: 28-29). The former represents the Moving Ego metaphor, the latter represents the Moving Time metaphor. The time line of (2) is compatible with both metaphors.

5.2 Temporal Information in Sentences

5.2.1 The coordinates of temporal location

Linguistic communication is centered at the speaker, and its coordinates intersect at the zero-point of here and now (Kurylowicz 1972:174). The speaker's centrality enables the identification of time and place. It also implies an organizing consciousness which provides a temporal perspective for sentences, a standpoint "from which the speaker invites his audience to consider the event" (Taylor 1977: 203). Every sentence has a temporal standpoint. In simple sentences the standpoint is the same as the temporal location of the situation talked about. Generally, sentences about the Present have a present standpoint, and sentences about the Past and the Future have past and future standpoints respectively.

The canonical location for speaker and situation is the Present, or Speech Time. Tenses often locate a situation or time relative to this orientation point. In sentences about the past, present, and future, a situation is located by its relation to Speech Time (SpT). (3) illustrates:

(3) a. Alan is at the office—Present: simultaneous with SpT
b. Alan worked late—Past: precedes SpT
c. Alan will write a letter—Future: follows SpT

Sentence (3b) indicates futurity with a modal (*will*) rather than tense. This is a peculiarity of English which will not concern us here.

In complex sentences, a past or future time serves as secondary anchor for the location of a situation. The situation is located at a time preceding, following, or simultaneous with the secondary anchor. The possibility of secondary (and tertiary) orientation implies a system of some kind. The temporal sub-systems of language allow past and future times to serve as secondary anchors for temporal location.

Shifts in orientation are signalled by syntactic embeddings and other dependencies. In sentence with a shifted orientation point temporal expressions have the same relational value that they have in simple sentences. The past tense in English, for instance, consistently indicates anteriority, either to Speech Time or to a secondary anchor time. Consider the interpretation of the past temporal expressions in the embedded clause of (4).

(4) The Prime Minister will announce at midnight
that he burned the documents.

On the Future reading, both the Prime Minister's announcement and the burning of documents will take place after SpT. Both the main and embedded clause of this sentence indicate times after SpT. The past tense in the embedded clause is oriented to the Future time established in the main clause. The past tense has its usual relational value of anteriority. On the mixed reading, the announcement will take place in the Future but the documents have already been burned at SpT. The past of the embedded clause is oriented to, and precedes, SpT.

Temporal expressions of futurity may also have a secondary reference point. In (5) for instance the future adverbial *next week* indicates a time subsequent to a past time.

(5) Mary said last Tuesday that she was leaving in 3 days.

In this sentence the adverbial *in 3 days* may anchor to the past reference time of the main clause, or to SpT. The ambiguity of these examples is due to the presence of flexible deictic adverbials which may be anchored either to SpT, or to another time. Not all deictics allow this: *yesterday* and *tomorrow*, for instance, can only be anchored to SpT. As the examples indicate, verbs of communication and consciousness generally allow shifted temporal anchors.

Another type of structure that allows a secondary orientation point is the Perfect construction. In languages with a grammaticized Perfect, sentences in the Past and Future have both a primary and a secondary orientation points. (6) illustrates for English. The auxiliary *have* indicates anteriority to SpT, the primary orientation time; the secondary reference time is specified by the fronted adverbial.

(6) Last Sunday Alan had already arrived.

(6) says that Alan's arrival occurred at a time prior to last Sunday. Thus it involves three times: SpT, last Sunday, and the time of Alan's arrival. Perfect sentences are discussed more fully below.

Summarizing, temporal location is indicated linguistically with reference to Speech Time. Tense and adverbials locate a situation by specifying its relation to an orientation point, or anchor. In simple Present, Past, or Future sentences the anchor is SpT, and situations are related sequentially to it. Complex sentences may have a secondary anchoring time to which a secondary situation is related. Temporal forms - tense and adverbials—have a consistent relational value: their meaning in a given sentential context is calculated relative to the primary or secondary anchor. Embeddings and particular linguistic forms such as the English auxiliary *have* signal secondary anchors. I distinguish temporal location, which holds of situations, from temporal reference. I shall say that sentences make temporal reference, and that situations are temporally located.

5.2.2 *A systematic account of temporal reference and temporal location*

I now introduce a systematic account of the temporal information in sentences, and of how it is conveyed by linguistic forms. The account will allow a better understanding of the interaction of aspect and temporal location, and lays the groundwork for the formal interpretation of temporal location in Discourse Representation Theory.

The approach that I will sketch accounts in a unified manner for temporal reference in simple and complex sentences. The basic idea, inspired by the work of Hans Reichenbach, is that three times are either needed or allowed to temporally locate the situations in all types of sentences. This idea allows a single general analysis that embraces the following different but related points: (1) two times are implicated in the temporal location of simple sentences; (2) some sentences require an additional time because they have secondary orientation points; (3) all sentences have a temporal perspective, or standpoint. The general account analyzes all sentences in terms of three times.

The three times are Speech Time, Reference Time, and Situation Time, following Reichenbach (1947: §51). Speech Time is the center of the system. Reference Time is the temporal standpoint of a sentence; and, in complex sentences, Reference Time may function as a secondary orientation point. Situation Time is the time at which the situation is located; it occurs at the interval [I]. The interval [I] of Situation Time is temporally independent of the situation itself. This provision is due originally to the Reichenbachian account of Kamp & Rohrer (1989: 62).[3] It turns out to be essential to the formalization of the two-component theory. The independent interval I is the locus for aspectual viewpoint (Chapter 7).

Reference Time is the temporal standpoint of a sentence; in complex sentences, Reference Time may function as a secondary orientation point. The times are related to each other by the basic ordering relations. In simple Present sentences all three times are simultaneous. In simple Past and Future sentences, Reference Time (RT) precedes or follows SpT, and is simultaneous with Situation Time (SitT). To interpret

a tensed sentence, we seek to identify the location of SitT. In many sentences SitT is specifed by a temporal adverb or subordinate clause; in other cases SitT may be recovered from context.

Let us begin with sentences which require three different times for interpretation. They are fundamental for understanding the approach. Three times are needed to present the temporal information given in (5), repeated here as (7); a time line is given in (7b).

(7) a. Mary said last Tuesday that she was leaving in 3 days.
b. .....Time 2.....Time 3.....Time 1
last Tuesday +3 days SpT
Mary said Mary leave

Consider the times in this sentence, and how they are conveyed. The main clause event [Mary say] occurs at a time in the Past, indicated by the past tense and specified by the time adverbial. This is RT_1, anterior to SpT. For the main clause there are only two times, so RT_1=$SitT_1$. The embedded clause adverbial specifies a time later than RT_1 and anchored to it: $SitT_2$. The event [Mary leave] is located at this later time. In this sentence the main clause RT functions as RT for the embedded clause, RT_2. Here and in other cases, SpT is always Time 1; RT is Time 2; SitT is Time 3. The information is set out in (8):

(8) Temporal interpretation of (7a)
Main clause: RT_1 < SpT; RT = last Tuesday; RT=SitT
Embedded clause: RT_2 = RT_1; $SitT_2$ > RT_2, in 3 days

There is also a reading in which the adverbial of the embedded clause anchors to SpT: the departure is scheduled for 3 days after SpT.

Consider next the temporal reference of a sentence in the future Perfect. The Perfect, indicated by auxiliary *have* in English, locates a situation prior to RT; in this case, RT is in the Future. (9) illustrates; the time line and interpretation is given below.

(9) a. Next Sunday Algernon will have already arrived.
b. Time 1.....Time 3.....Time 2.....
SpT prior next Sunday
A. arrive
c. RT > SpT; RT = next Sunday; SitT < RT

The event of Algernon's arrival is located at a time after SpT, and before next Sunday. The present tense, *will*, and the adverbial of the sentence establish RT in the Future, after SpT; auxiliary *have* indicates a prior SitT, at which the event [Algernon arrive] is located.

These examples show that three times are needed to account for the temporal location of situations in embedded clause and Perfect sentences. The interpretation of sentences involving successive situations is more complicated, as indicated above. For simplicity and generality, it is desirable to have a single system that accounts for temporal location in all types of clauses. For simple sentences the system will provide that two times are simultaneous.

There is an additional benefit in interpreting all sentences to have three times: it brings the notion of a temporal perspective or standpoint, Reference Time, into relation with the times required to temporally locate a situation. RT has a dual function. It is part of the system of temporal location, serving as secondary anchor time in complex sentences. In addition, RT gives the temporal standpoint of a sentence. All sentences have a locus, RT, from which the situation talked about is presented. In simple sentences the temporal standpoint is past, present, or future. In more complex cases, the secondary orientation point plays this role.

The contribution of Reference Time is nicely brought out by comparison of simple Past and present Perfect sentences. Following Reichenbach, let us compare the sentences of (10):

(10) a. Henry has arrived.
b. Henry arrived.

These sentences have the same truth conditions, yet they are subtly different. Intuitively, the difference is one of perspective: the Perfect sentence, (10a), presents the event from the standpoint of the present, while (10b) takes the standpoint of the past. The intuition is explicated with the notion of Reference Time. The temporal difference between the past and the perfect is due to the difference in RT. In the past sentence, RT is prior to SpT; in the Perfect sentence, RT=SpT, but SitT is prior. (11) sets out these relations on a time line:

(11) Temporal relations in the sentences of (10)
a. .....SitT.....RT = SpT
b. .....SitT = RT.....SpT

In (11a) the past event is located in a present reference period that extends into the past from SpT, while in (11b) the event is set squarely in the past. This notion of R, as the locus for a temporal standpoint, affects the interpretation but not the truth conditional meaning of a sentence. The Perfect construction is discussed in 5.3.2.

Additional evidence that RT gives the temporal standpoint of a sentence comes from shifted deixis. We saw in (7) above that an embedded clause may be anchored to RT of the higher clause. This RT may function as a shifted center for deictic adverbs. Consider (12), a similar example. The adverbial of the embedded clause may anchor to SpT; it may also anchor to *last Sunday*, the RT of the main clause. Each anchoring leads to a different interpretation of when the Prime Minister will resign. On the normal deictic reading, the adverbial *in three days* is calculated from SpT; on the shifted reading, the time is calculated from last Sunday. The readings are set out in (12c-d):

(12) a. The Prime Minister announced last Sunday that he would resign in 3 days.

b. Main clause:.....SitT=RT.....SpT
last Sunday

c. Embedded clause: RT=RT_1.....SpT.....SitT
last Sunday in 3 days

d. Embedded clause: RT=RT_1.....SitT.....SpT
last Sunday in 3 days

The time established in the main clause functions as RT for both clauses. The tense and adverbial of the main clause locate the event [the Prime Minister announce] and establish the temporal standpoint. In both readings, this RT serves as the anchor for the event of the embedded clause, indicated by *would*. In the reading of shifted deixis, (c), the embedded adverbial is anchored to RT_1. In reading (d), the embedded adverbial is anchored to SpT: the actual time of the resignation must be calculated from SpT.

Shifted deixis implies a center of consciousness at the new orientation time; see Banfield 1981 for discussion of this notion. Canonically, of course, communication occurs at Speech Time and deictics are anchored to that time. With a shifted orientation time the center of communication and consciousness shifts also. Reference Time functions as the shifted center. In sentences like (12) the verb *say* directly indicates a center of consciousness. The center may also be presented by implication, as in (13).

(13) Jane had lost her watch a week ago.

There is no explicit Reference Time in this sentence; the adverbial *a week ago* is anchored to a tacit Reference Time which is understood to involve Jane's consciousness. See Smith 1978, 1980 for discussion of the temporal interpretation of such sentences.

When a tense can be a deictic center, it functions as a center of consciousness and communication, or personal perspective. Generally the personal perspective of a sentence is also its temporal standpoint. But the two do not always coincide. When a tense cannot accept shifted deixis, it can function as a secondary reference point, but cannot accept the deictic expressions that indicate personal perspective. The *Passé Simple* of French, for instance, has a past temporal standpoint but a present personal perspective (Chapter 9).

The contribution of context to temporal interpretation can also be explained with the notion of Reference Time. RT gives an indispensable focus when there are simultaneous or overlapping relations. Overlapping events share RT; events in sequence do not. This accounts nicely for the differences in the fragments of (14):

(14) a. (i) At that point, Jim arrived. (ii) Sam was phoning the police.
b. (i) At that point, Jim arrived. (ii) Sam phoned the police.

The events in both fragments are related to the time of Jim's arrival. Sentence ii of (14a) has the perfective viewpoint, and the events are sequential. Sentence ii of (14b) is progressive. The events share RT.

When sentences present events sequentially, as in discourse, this picture must be augmented. As one event succeeds another, the times of occurrence cannot always be calculated with the information of tense and adverbials alone. Successive events occur at slightly different times, even if no time adverbial make the times explicit.

Consider for instance the temporal location of the second event in the discourse fragment of (15):

(15) Henry opened the door. Fido ran out into the yard.

The fragment presents two events, e_1 and e_2. They are located by the same temporal expression, the past tense, and their appearance in succession suggests that they have the same reference time. Yet the two events do not occur at precisely the same time. The sequential order of the sentences, and one's knowledge of the world, suggest that e_2 occurred very shortly after e_1. The time of e_2 is calculated from a time immediately after e_1, rather than from the RT of the event.

The dynamic semantic interpretation of discourse must be able to determine a SitT that is not simultaneous with RT in successive situations. For such cases SitT must be calculated in terms of the preceding event. Kamp & Rohrer 1989 show with similar examples in French that it is necessary to distinguish the time of calculation from that of reference time, or a temporal standpoint. The same sort of situation occurs in extended flashbacks that share a past reference time. Kamp & Rohrer introduce an additional time to account for the calculation of times for successive situations that are not explicitly located by adverbials (1989: 47). The succession time is needed for a dynamic interpretation which keeps track of the shifting temporal locations of discourse. I assume that some device for succession is required; here I concentrate on the systematic expression of times in sentences referring to single situations.

The function of a semantic representation is to give with precision the semantic information conveyed by linguistic forms. In the domain of temporal location, the construction of a semantic representation requires a rather radical conversion from the linguistic presentation to the semantic one. Semantically, temporal location is predicated externally of a situation. The locating information has scope over the situational information. In syntactic structure, however, the relevant forms may appear relatively low in the syntactic tree, so that they do not c-command other forms in the sentence over which they have semantic scope. This statement holds for simple surface structures but not necessarily for all abstract syntactic structures, for instance, those of Government Binding Theory.[4]

The external semantic relation is modelled with a syntactically based scopal structure, as in (16). (16a) presents a sentence, (16b) its syntactic surface structure, and (16c) a syntactically based scopal structure which distinguishes temporal location form and viewpoint forms from the verb constellation. The latter is represented as $_{vCon}$[NP V NP]. The verb form carries viewpoint information.

(16) a. Xavier was playing his flute for awhile yesterday.
b. $_S$[[NP] Aux+tense V NP Adv1 Adv2]]
c. $_S$[[tense Adv1 Adv2] [Prog $_{vCon}$[NP V NP]]]

In (16c) the temporal forms appear in a single constituent that has the rest of the sentence within its scope. The viewpoint morpheme and verb constellation are in a separate constituent. Scopal structure like this is also known as a 'normal form' (Kamp & Rohrer 1989).

5.3 Tenses and the Perfect

In this section I discuss tense, the Perfect, and certain peculiarities of the present tense which are remarkably consistent across languages.

5.3.1 Tense

The analysis of tense must be developed for each language. Tenses have consistent relational values: anteriority, posteriority, or simultaneity. They may have a fixed or flexible orientation. Tenses with fixed orientation are always related to SpT, or to a different orientation time. The *Plus-que-parfait* of French, for instance, is always related to a past time. Tenses that are flexible depend on SpT or an already established orientation point. The English Past tense, which indicates anteriority, is of this type. Canonically it relates to SpT, but it may also indicate anteriority to a future time, as we have seen. The traditional terms for tenses that are fixed and flexible in orientation are absolute tense and relative tense, respectively.[5]

Not all temporal reference is made by tense, as noted above. In some languages the future is indicated by another type of morpheme, e.g. the modals in English. It is common to have a combination of present tense and future adverbial indicates the future, sometimes called the Futurate. English and French have a Futurate construction; its characteristics are discussed in Chapter 8.

Chinese, lacking tense, has a simple temporal location system. The tacit orientation point is SpT, which functions as an anchor in the interpretation of adverbials, and often in the interpretation of perfective aspect. Chinese has deictic adverbials which are oriented to Speech Time: e.g. *zuotian* (yesterday), *mingtian* (tomorrow). The aspectual perfective viewpoints *-le* and *-guo* often appear in sentences without explicit temporal location. Such sentences are understood as located at SpT; the situations presented are taken as terminated or completed.

5.3.2 The Perfect

Perfect constructions appear in many languages. Traditionally, the term referred to a tense of ancient Greek. It is now used for constructions that have a certain temporal and aspectual meaning, whether or not they involve tense. Perfect constructions generally convey the following related meanings: (1) the situation precedes Reference Time; (2) the construction has a resultant stative value; (3) the viewpoint is perfective; (4) a special property is ascribed to the subject, due to participation in the situation. There are some differences across languages but these are the primary identifying characteristics of the construction. A point of terminology: there is a difference between the 'perfect' and the 'perfective'. The former refers to a construction with particular temporal and aspectual characteristics, the latter refers to a closed aspectual viewpoint. Both come from the same Latin word.[6]

The perfect value is often conveyed by a periphrastic tense form such as the English auxiliary *have*. However, other forms may also convey it, for instance the Chinese aspectual viewpoint *guo*. I will present the main notions associated with the Perfect, then consider how to account for it within the two-component approach to aspect and

Discourse Representation Theory (DR theory). There is a considerable literature on this topic. My aim is to understand the basic semantic meaning of the construction, but I do not attempt to cover the full range of connotative and contextual meanings that arise.[7]

Perfect sentences locate a situation prior to the RT of a sentence. The examples illustrate present, past, and future Perfects in English. The adverbials are fronted to avoid ambiguity: they specify RT.

(17) a. Now John has arrived.
b. Last Saturday John had (already) arrived.
c. Next Saturday John will have already arrived.

In these examples, the event [John arrive] occurs at a time before RT. The Perfect presents the prior situation as related to RT: this is one of its hallmarks. In (17a), for instance, the moment of speech functions as RT, and the present is understand as covering an interval that extends back from SpT. This is an "extended now" interval (McCoard 1984: ch 4). The reference times of (17b-c) are similarly extended to include the time of John's arrival.

Perfect sentences have a stative value. They present a state of affairs which results from the prior situation, (18) illustrates:

(18) a. Susan has gone to Guangzhou.
b. They have built a summerhouse.
c. Elaine has danced with Bill.
d. The stone has rolled down the mountain.
e. Helen has been sick.

These sentences focus on a state that obtains in the present, a state due to the occurrence of the situations mentioned. There is neither a requirement nor an implication that the final states of the situations themselves continue. I return to this point directly. The viewpoint of these sentences is perfective and therefore closed, that is, the situations are presented with initial and final endpoints. (18e), a stative, is exceptional; see the discussion of the English Perfect in Chapter 8. Perfect constructions usually allow only a closed aspectual viewpoint.

Present Perfect sentences ascribe to their subjects a property that results from their participation in the prior situation. If at some time Henry has laughed, danced, built a sandcastle, the property of having done these things is asserted of Henry. I will call this the 'participant property.' The participant property holds whether or not the situation is of the sort that has an enduring result. Consider (19), for instance

(19) a. Henry has been fired.
b. The painting has been dropped three times.

Both of these sentences assert that their subjects have participated in the prior events. We understand not only that a firing has taken place, or that a painting has been dropped; the sentence ascribes to Henry the property of having been fired, to the painting the property of having been dropped. When the subject is a sentient being

one naturally interprets the property as an experience undergone by the sentient being. Hence the frequent 'experiencer' sense of the construction.

There is a pragmatic felicity condition on the use of the Perfect: the subject of a Perfect sentence must be in a position to receive the participant property. Perfect sentences are infelicitous when this is not met. In the following well-known example, the person referred to by the subject NP is not alive at RT. Consider (20), uttered in 1989.

(20) Einstein has lived in Princeton.

This sentence is grammatical but infelicitous when uttered at a time after the death of Einstein (Jespersen 1931:60, Chomsky 1970:85). We explain this in terms of the participant property. Einstein cannot bear the participant property in 1989, the time of utterance of (20), and so it is pragmatically impossible to ascribe it to him. This is the force of the example. The felicity requirement, then, is roughly as in (21):

(21) Felicity condition for the present Perfect
The person to which the subject nounphrase refers must be pragmatically able to bear the property ascribed to them.

The notion of 'Current Relevance' is sometimes invoked to explain the infelicity of sentences like this. (Jespersen 1931: 47, 56 et seq; McCoard 1978, ch 2).

Perfect sentences often refer to a prior situation without precise specification of the time at which it occurred. Reflecting this, Perfect constructions are sometimes known as indefinites or experientials; they focus on the occurrence or experience of the prior situation rather than the situation itself. But it is too strong to say that the Perfect construction is incompatible with specification of the prior time. Specification of the prior situation is possible in the Chinese *-guo* construction, which has the characteristics of the Perfect. Iljic presents examples in which *-guo* sentences appear with dates and other adverbials; he notes that such sentences are low in frequency (1987:53 et seq).[8] Iljic's examples show that the Chinese construction does not require that the prior situation be indefinite temporally. Languages vary in this regard. Perfect sentences with specifying adverbials do not appear in English: a sentence such as **Sam has arrived yesterday* is ungrammatical, though quite intelligible.

Summarizing, Perfect sentences present a state located at Reference Time, which state is due to the prior occurrence of a closed situation. If the situation involves change of state, the resultant state need not obtain at Reference Time. The Perfect merely asserts that the situation occurred during the extended reference period. Perfect sentences also ascribe to the subject a participant property that follows from the subject's participation in the situation.

I now consider more closely the relation between SitT and RT in the Perfect. The situation is prior to the temporal standpoint of the sentence, yet conceptually related to it. Consider (22):

(22) a. Mary has arrived.
b. Mary had arrived.
c. Mary will have arrived.

In (22a), RT = ST, the moment of speech; the event [Mary arrive] is prior to that time, yet also part of a general period of the present which extends backward, not being limited to SpT. (22b-c) have unspecified Past and Future reference times; they also convey that the event precedes the reference time. These are the simplest cases of the perfect. This relation between Reference Time and Situation Time holds in Perfect sentences with a non-Present specifying adverbial. (23) illustrates; *already* facilitates the perfect reading by excluding the shifted past interpretation of *have*.[9]

(23) a. Last week, Tom had already been to London.
b. Yesterday, Melvin had already seen the doctor.
c. Next week, Melvin will have already seen the doctor.

The adverbial specifies Reference Time, and the situation precedes that time. In (23a), Tom's visit preceded last week; in (23b), Melvin saw the doctor prior to yesterday; in (23c) the time at which Melvin is expected to see the doctor precedes next week.

The prior events extend the reference interval of a Perfect, and provide a bound for it. Thus the sentences in (22) and (23) involve a temporal reference interval which is bounded by RT and SitT. The time of the situation functions as the earliest time of the reference interval; at least one time of the reference interval which follows the situation interval. This is one of the basic patterns of the Perfect.

A different pattern holds for present Perfect sentence with locating time adverbials. For such sentences, SitT occurs during the RT interval, as in the examples of (24):

(24) a. Susan has seen Melvin this week.
b. Tom has been here today.

The adverbials denote intervals that include the moment of speech, and the situation occurs during the interval. The notion of an extended Present interval has a special status. This is not surprising since the Present requires other special statements too; cf 5.3.3 below.

The aspectual and temporal meanings of the Perfect are closely related. SitT is part of a reference interval, sometimes with a tangible, enduring result, as in *The fender has been dented*; sometimes with an experiential result, as in *John has been fired.*

Formally, the stative value of Perfect sentences will be treated as a property of a derived situation type, triggered by the Perfect morpheme for a given language. Perfect statives have a complex internal structure, which involve the verb constellation and viewpoint of the inner sentence. The treatment is similar to that of habituals as derived statives with the internal structure of the situation type given. An advantage of the approach is that it allows for Perfect constructions with different viewpoints, a requirement for the analysis of English. The participant property follows directly from this notion of the Perfect construction, and the extending function of the situation interval in the perfect. Scholars have debated the question of whether the Perfect involves temporal location or aspect. According to this analysis, both domains are involved. The Perfect constructions will be discussed in more detail for individual languages. See Chapter 8, Section 8.4.2 for further discussion of the Perfect in English; the French *Passé Composé* and Chinese *-guo* also have properties of the Perfect construction.

5.3.3 *Sentences about the Present*

There is a pragmatic principle of interpretation for sentences about Present time, requiring that they be interpreted in a certain way: Present sentences may not include the endpoints of situations. The principle is expressed differently by different languages.

Sentences about the Present time may have a wide or narrow span. The Present may be a large interval that includes the moment of speech, but it cannot have both an upper and lower bound other than the moment of speech. In other words the interval of the Present is limited: it may not be bounded by two other times.

Trying to make sense of this limitation, we are led to consider people's notions about present time and about utterances. We conceive of the present moment as instantaneous; utterances, too, are conceived as instantaneous. It follows that a Present utterance can only refer to an event that is terminated or completed, or an event in progress. Present time utterances cannot present events in their entirety, because doing so would involve more than one bounded moment, at least in principle. Kamp & Rohrer give an interesting reason for this conceptual relation between utterances and events. Noting that "no event whose duration is properly included within that of the entire discourse, may be reported in the present tense" (1989:72), they suggest that a presupposition leading to it underlies verbal communication. The presupposition is that verbal expression takes place only after the thought it expresses has been conceived.

Syntactic and semantic constraints follow from these conceptual limitations, depending on the pattern of a particular language. The generalization is that one cannot talk about Present situations with a viewpoint that includes their initial and initial and final endpoints. The viewpoint must be either imperfective, neutral, or a perfective that excludes endpoints.

The wide span present extends backward and/or forward from Speech Time without a temporal bound. This allows segments of durative situations to be located at the Present, as (25) and (26) illustrate with progressive and stative sentences. Adverbials may indicate an interval of which Speech Time is a part.

(25) a. He is rehearsing.
b. They are solving the problem.
c. She is winning the race.

(26) a. Mary is in a good mood today.
b. Helen is working hard these days.
c. Spencer travels for IBM this year.

The sentences are Stative or have the progressive viewpoint, they all exclude endpoints. These examples show that intervals including the Present moment can be indicated with adverbials such as *these days*.

In English, Present sentences with the perfective viewpoint are interpreted as stative. Sentences with event verb constellations are taken as habitual, or derived statives; sentences with Stative verb constellations present ongoing states. (27) illustrates:

(27) a. Mary reads the newspaper. (Accomplishment)
b. James plays the violin. (Activity)
c. Sue coughs. (Semelfactive)
d. Bill wins the race. (Achievement)
e. Susan owns the farm. (Stative)

Neither the Semelfactive nor the Achievement sentence has an event reading, though the events are in principle instantaneous. This follows from the narrow span of the Present. To talk about an instantaneous event perfectively implies that the event has taken place. But then there must be a moment other than the Present itself. The habitual stative interpretation is, of course, consonant with the limited temporal span of the Present.

There are also well-known marked sentences in the Present, which telescope time. They have a closed interpretation. Such sentences may be performatives, sentences that constitute the performance of a verbal act (Austin 1961), as in (28).

(28) a. I hereby christen this ship.
b. I promise to take Susan to the movies.

To utter these sentences is to perform the acts, assuming that felicity conditions are met. Perception sentences are also good in the Present: they constitute reports of instantaneous events, reflecting perhaps the special immediacy of perception. Reports of mental Achievements are similar, as (29) illustrates:

(29) a. I see the moon.
b. I feel the current of the river.
c. Now I understand.
d. Oh! I see!

There is also a reportive use of Present sentences, in which they refer to complete or terminated events. Such sentences have a dramatic flavor. They are often found in the eyewitness broadcasts of sportscasters, and in the stage directions of play scripts. (29a) is taken from the opening directions of *Mourning Becomes Electra*, by Eugene O'Neill, cited in Green 1980.

(30) a. Seth and Minnie come forward as far as the lilac clump . . . .
Seth nudges Minnie with his elbow . . . .

b. . . . he gets it in to Hewlett and he's fouled immediately by Malnati . . . and the rebound goes to Joe May.

These sentences telescope time. We understand them punctually, as though the events take only an instant, suspending our knowledge of their normal duration.

Many languages have a Present construction that states one bound on an interval that includes the present. Constructions with *since* and *until* are of this type; they may

have such adverbial bounds. In English *since* requires the Present Perfect; the construction is simple *Présent* in French.

(31) a. Mary has been here since Tuesday.
b. Marie est ici depuis jeudi.

The examples illustrate the pattern; the idiosyncrasies of particular languages are beyond the scope of this discussion.

The principle that Present sentences do not include endpoints is realized differently in the five languages investigated here. The French present tense codes the imperfective viewpoint, and thus excludes endpoints. The Russian present tense has both imperfective and perfective forms. However, only the imperfective forms actually refer to the Present: the Russian perfective refers to the Future. Thus the interpretations of Russian Present sentences conform to the principle. Present sentences in English may have the perfective or imperfective viewpoint, but the former must focus on statives, excluding endpoints. Navajo has no present tense; imperfectives are taken as referring to Present time, in the absence of information to the contrary. Chinese has no tense; again, sentences with imperfective aspect are neutrally taken to refer to the Present. All Present sentences in English have a stative interpretation which excludes endpoints.

Formalization of the limitation of Present sentences will vary from language to language. In some cases it can be effected simply by stating the aspectual value of the present tense as imperfective or neutral in viewpoint. In other cases, English for instance, the Present limitations must apparently be stated in terms of bounds of different kinds; see the chapter on English for discussion. The pragmatic requirement holds for sentences that refer to the Present time, or moment of speech; it does not hold for sentences with the present tense that refer to other times.

5.4 Temporal Adverbials

Temporal adverbials combine with tense to specify the location of a situation in time. They also contribute to the aspectual meaning of a sentence. In this section I discuss the contribution of adverbials to aspectual meaning.

The main types of temporal adverbials are listed in (32):

(32) Types of temporal adverbials
Locating adverbials: at noon, yesterday, before Mary left, etc
Durative adverbials: for an hour, from 1 to 3 pm
Completive adverbials: in an hour, within an hour
Frequency adverbials: often, never, 3 times a week, every week

Adverbials of these types appear quite generally in language. There is some variation in our sample of five: Chinese and Navajo, for instance, do not have completive adverbials such as *in an hour* (see Chapters 11, 12). All these adverbials interact directly with the aspectual system. Locating adverbials may co-occur with the other types.

Locating: Locating adverbials contribute to the specification of RT or SitT. In sentences with one locating adverbial, the adverbial generally specifies RT.[10] The adverbials specify a moment or interval which temporally locates the situation. The relation of the specified time to the situation depends on the way the adverbial information meshes with the viewpoint and situation type of the sentence, and with world knowledge. Consider the examples in (33):

(33) a. We arrived at noon.
b. We were walking at noon.
c. I read the newspaper yesterday.
d. We moved last year.

In (33a) the adverbial is momentary and the event instantaneous, so it is reasonable to infer that the former locates the latter. (33b) also has a momentary adverbial; but the viewpoint is imperfective and the situation durative. We infer that the adverbial specifies one of the moments at which the situation obtains. In the other two examples world knowledge suggests that the events occurred during the intervals specified by the adverbials (see Chapter 4). Locating adverbials are also known as "frame adverbials" (Bennett & Partee 1972). As the term suggests, the situation talked about fills all or part of the time frame specified by the adverbial.

Durative: Adverbials of duration contribute to locating a situation in time. Semantically this information is external to the situation type of a sentence. Durative adverbials also have an aspectual feature: they state specific bounds of a situation. They are compatible with durative atelic verb constellations and statives, and incompatible with durative telic verb constellations, as (34) illustrates:

(34) a. Theodore slept from 1 to 3pm. (atelic)
b. Harry wrote for 3 hours. "
c. Sam was here for 2 days. (stative)
d. Jerry wrote the report for two hours. (telic)
e. Jerry read the book from 2 to 5pm. "

There is a clear difference between these sentences. (34a-b) have atelic verb constellations; they are Activities with independent bounds. The bounds make them derived telic in situation type. (34b-c) have telic verb constellations; they require shifted interpretations, according to the Principle of External Override. What triggers the shift is the incompatibility between the value of the verb constellations (telic) and the adverbials (atelic); see the discussion in Chapter 3.

There are sentences in which a durative adverbial is internal semantically to the verb constellation. In such cases the adverbial contributes to the temporal characterization of the situation. The crucial sentences that demonstrate this fact have two adverbials of duration; the outer adverbial locates the situation, while the inner adverbial helps to characterize it:

(35) Mary went to Paris for three days for three weeks.

This sentence may be paraphrased: Mary went to Paris with the plan or intention of staying for three days, but actually stayed for three weeks. The three-week duration is an intensional property of the idealized situation, independent of its actual unfolding in time. In other words, the inner adverbial specifies a property of the situation type. The outer adverbial gives the temporal location of the situation. Examples like this show that there are two different durative adverbial positions in sentences of English.

Since there are two positions for durative adverbials, we ask whether a single adverbial can have both an internal and an external interpretation. If the answer is Yes, the adverbial should both locate and characterize the situation entity. If the answer to the question is No, the adverbial should simply locate the situation. To find out, we consider the interpretation of the adverbial in a simple example. The answer is clear: the adverbial merely locates the situation:

(36) Mary slept for three hours.

(36) tells us nothing about about Mary's intentions: she might have intended to sleep for three, five, or two hours. On the basis of this and many other examples, we conclude that a single adverbial of duration does not indicate the desired or intended length of a situation. Thus single durative adverbials have only the external interpretation. However they must be compatible with the telic/atelic value of the situation type, which involves its internal structure.[11]

Compatibility between adverbial and situation type will be handled by aspectual features and compositional rules. Adverbials have temporal features which are listed in the lexicon, like all linguistic forms relevant to temporal interpretation. When the features of adverbial and situation type are compatible, the standard external interpretation follows. If they are incompatible, a shifted interpretation arises (Chapter 3).

Completive: Completive adverbials locate a telic event at an interval, at the end of which the event is completed. Their aspectual value is telic. Completive adverbials are compatible with telic events, and trigger a shifted interpretation with verb constellations of other types. The examples illustrate; the notations to the right indicate the basic-level situation types of the verb constellations:

(37) a. Bill walked to work in an hour. (telic)
b. Mary wrote a sonnet in 5 minutes. "

c. ?Bill swam laps in an hour. (Activity)
d. ?Mary believed in ghosts in an hour. (State)

(37a-b) are straightforward, whereas (37c-d) require shifted interpretations. (37c) is a derived Accomplishment, by the Principle of External Override: we must assume that Bill had a specific number of laps to swim during the hour. The shift is different for (37d). It is a derived inchoative, paraphrasable as, At the end of an hour Mary came to believe in ghosts. The adverbial has an ingressive interpretation.

Completive adverbials are ingressive when they locate instantaneous events. The adverbial denotes an interval, at the end of which the event occurs.

(38) a. They reached the top in ten minutes.
b. He won the race in ten minutes.
c. She knocked at the door in ten minutes.

The interpretation of completive adverbials constitutes a test for the situation type of a sentence. If a completive adverbial gives the interval of an event, the event is an Accomplishment. If the adverbial has an ingressive interpretation in a given sentence, the situation type of that sentence is an Achievement.

There is an aspectual clash when adverbial and situation type have different values, as we have seen in Chapter 3. Such clashes are resolved by a shift in the value of the verb constellation, which receives a marked interpretation. The adverbial overrides, requiring an interpretation of the situation type as compatible with it. The Principle of External Override accounts for the different cases that occur. To recapitulate in the context of temporal location, I give examples of some other clashes. Telic verb constellations are taken as atelic when they appear in a sentence with a simple durative adverbial. (39) illustrates for Accomplishment verb constellations, with paraphrases of the shifted, atelic interpretations.

(39) Accomplishment to Atelic
a. Jerry wrote a report for two hours.
b. Jerry did 2 hours of report-writing.

a' Sue read a book from 2 to 5pm.
b' Sue did some book-reading from 2 to 5 pm.

The sentences present events of report-writing and book-reading, which do not have natural final endpoints. Similarly, atelic verb constellations undergo a shift and are interpreted as telic in the context of completive, telic, adverbials.

Achievement and Semelfactive constellations shift to a Multiple-event Activity reading in the context of a durative adverbial, as in (40).

(40) Instantaneous to Durative
a. Mary knocked at the door for an hour.
Mary spent an hour knocking at the door.

b. All that summer John found crabgrass in his yard.
During the summer John frequently found crabgrass in his yard.

c. Mary reached the top for an hour.
(none)

In some cases, such as (40c) there is no plausible shifted interpretation. The difference between the examples of (40) is a pragmatic one.

Frequency adverbials: Frequency adverbials contribute to the temporal location of a situation. They do so by indicating the recurrent pattern of events or states within the reference interval. For instance,

(41) a. Mary drinks carrot juice every day.
b. Sam played tennis once a week last year.
c. We always went to the beach in the summertime.

Such sentences are statives of the habitual type.

These adverbs have an aspectual value: the presence of a frequency adverbial gives a sentence an habitual interepretation. Habituals are derived statives. Recall however the habitual interpretation can also arise without frequency adverbials: in present tense event sentences with the perfective viewpoint, and when triggered by pragmatic factors.

Perhaps there can be more than one frequency adverbial in a sentence. The examples are marginal. If they are acceptable, then frequency adverbials may be internal or external to situation type, like adverbials of duration and completion. For instance, the apparently paradoxical (42a) is interpretable according to the paraphrase in (42b):

(42) a. John plays tennis every day on weekends.
b. John plays his in-principle-daily tennis game only on weekends.

The sentence can be interpreted to mean that John intends to play tennis every day, but in fact does so only on weekends. Examples like this are not strong, but they allow the intensional interpretation that one would predict for an inner rather than an outer adverbial.

Frequency adverbials are always external semantically and always acceptable for languages like English and French, which do not have other morphemes for habitual sentences. Some languages, including Navajo, have such morphemes: in Navajo the habitual is expressed as part of the aspectual system. The different types can be handled in a systematic fashion by providing that verb constellations have a feature of compatibility with the habitual interpretation.

The interaction of temporal adverbials and situation type will be analyzed by rules which are sensitive to syntactic and semantic factors. The crucial syntactic factor is whether a sentence has one or two adverbials of frequency or duration. The syntactic rules interpret adverbial scope according to the number of adverbials of a given type in a sentence. The rules produce scopal structure: they put adverbials into the appropriate constituents for interpretation. The crucial semantic factor is the aspectual features of the adverbial(s) and situation types. Rules for this factor are compositional, producing a situation type value for the combination of verb constellation and adverbial. See Chapters 3, 6 for discussion.

5.5 The Interpretation of Temporal Expressions

In this section I give a brief account of the mechanism for the temporal interpretation of simple, single sentences. I assume that temporal interpretation means determining RT and its relation to SpT, SitT and its relation to RT. The times are calculated by rule from the temporal expressions and the surface syntax of a sentence. Rules are required because the interpretation of a given expression varies according to the other temporal expressions in the sentence and the context. A more complete account would deal with complex sentences and the temporal interpretation of sentences in discourse (Smith, in preparation).

The analysis draws on semantic temporal features associated with each temporal expression. These features indicate relational meaning and systematic possibilities for interpretation. The temporal expressions of English are the two tenses (present and past), modal *will*, auxiliary *have*, and time adverbials. The rules assemble the relevant temporal information and produce an interpretation, The systematic analysis computes the value of RT by relating it to SpT or another time in the context; and the temporal location of SitT is calculated relative to RT.

Simple independent sentences are interpreted relative to SpT. The tense and adverbial together may establish RT. Tense indicates the relation of RT to SpT and the adverbial specifies RT, as in (43):

(43) a. Jane left 3 days ago.
b. Jane left before Bill arrived.
c. Michael will leave in 3 days.

Note that the tenses and adverbials are compatible in relational value. (43a-b) have past tense and a past adverbial; (43c) has future *will* and a future adverbial. I ignore other, non-temporal meanings of *will*. Since these sentences involve only two times, the interpretation must specify that SitT=RT.

There are combinations of tense and adverbial that cannot be analyzed: that is, they do not give enough information to determine the three times needed. The sentences below do not have full temporal interpretations, although they are well-formed.

(44) a. Jane was leaving in 3 days.
b. Michael was tired now.

In both cases, the adverbial specifies a time which is related to an unknown time. In (44a) the specified time *in three days* follows the unknown time, in (44b) the time is simultaneous with the unknown time. We can understand these partial interpretations with the notions of RT and SitT: although SitT is specified, RT is lacking. Sentences like those of (44) need an RT for interpretation, and normally appear in a context which supplies it. Note that in these examples the the tense and adverbial do not have the same value: (44a) has past tense, future adverb; (44b) has past tense, present adverb.

Taken together, these examples show that the adverbial in a main clause may specify RT or SitT. Auxiliary *have* has the same flexibility, with the relational value of anteriority. It may contribute to either RT or SitT: *have* indicates SitT in (45), and RT in (46).

(45) auxiliary *have*: SitT < RT
  a. Mary has arrived.
  b. Mary had already arrived.
  c. Mary will have arrived.

(46) auxiliary *have*: $RT_2 < RT_1$
  Last Sunday John left the county. On Friday he had closed his bank account, and had rented his house; at his office, he had emptied all the drawers and shelves; then he had told his staff to take a holiday, and had made his final arrangements.

In a narrative, a sequence like that of (46) might indicate a change of direction or a flashback.

Rules of interpretation for a given language will determine the times for a sentence on the basis of the temporal temporal expressions and syntax of a sentence. Three types of features are assigned to temporal expressions: Relational, Orientation, and Role features. Relational features give the value of an expression. They are based on lexical meaning. Thus the adverb *before*, auxiliary *have*, and the past tense all have the value of anteriority, < ; the adverb *now* and the present tense have the value of simultaneity, =; the adverb *after* and the modal *will* have the value of posteriority, >; etc. The features and their values must be established for each language. Kamp & Rohrer 1989 develop a set of temporal features to account for French; Kamp & Reyle 1993 do so for for English; their analysis is somewhat different from the one presented here.

The Orientation feature accounts for the fact that expressions differ in how they orient to SpT and other times in a sentence or discourse. The English tenses, both past and present, orient to a present or future time. They have a 'nonpast' orientation value. Auxiliary *have* and modal *will* are more flexible: they orient to Past, Present, and Future times. Temporal adverbials are generally flexible, allowing orientation to Past, Present, or Future times. But some strictly deictic adverbials are always oriented to Speech Time, e.g. *yesterday* and *tomorrow*.

The Role feature indicates whether an expression can contribute to Reference Time and Situation Time. Most expressions are flexible but there is one important exception, the modal *will* and its past tense form *would*. *Will* consistently indicates Reference Time, with the value of posteriority: thus sentences with *will* convey that RT follows SpT, or another time. This exceptional property is handled by a Role feature.[12] The features are summarized in (47):

(47) Features for Temporal Expressions of English

	Relational			Orientation			Role
	<	=	>	Flex	SpT	Nonp	
present tense	+				+		
past tense			+				+
aux *have*	+			+			
modal *will*			+	+			RT
Locating adv							
at—o'clock	+			+			
—ago	+		+				
yesterday	+				+		

The intepretation rules automatically have access to these features: they are listed in the lexical entries for temporal expressions.

I present as an example one simplified rule for interpreting the temporal expressions of a simple, independent sentence. When the relational values of temporal expressions are the same in an independent sentence, the tense gives the relation between SpT and RT; the adverbial specifies RT; SitT=RT. If there is no adverbial, RT is not specified beyond its relational value to SpT.

The left-hand side of the rule gives the configuration of temporal expressions; the right-hand side gives the interpretation. In the α,β notation α indicates a given value, and β indicates a different value. Only adverbials of the Locating type are included (notated as LAdv). The symbols X, Z indicate other material in the sentence.

(48) $_S[\ X\ _{Tns}[\alpha] + [Z]\ (_{LAdv}[\alpha])\ ] \rightarrow$
$_S[$ RT α SpT, RT= Adv; SitT=RT]

The rule says that the relational value of the tense and adverb gives the relation between RT and SpT. If both are past, the sentence specifies an RT prior to SpT; if they are present, then RT = SpT. The rule applies to the sentences in (49) as shown.

(49) a. John and Mary are in the park now.
→ $_S[$ RT = SpT, RT=now; SitT=RT]

b. John and Mary went to the movies (last Thursday).
→ $_S[$ RT < SpT; RT= last Thursday; SitT=RT]

The full rule is more complex because it includes the possibility of auxiliary *have*. Rules are given in more detail in Chapter 6.

We now have enough information to integrate the temporal location and aspectual information in sentences, and in DRSs. The next two chapters are devoted to this topic.

Notes

[1] Temporal location is discussed in traditional grammars, considering such notions as deixis, sequence relations between events, grammatical categories (Benveniste 1956, 1966; Bull 1971; Lyons 1977; see also the introductory summary in Comrie 1985). More formally-oriented work includes Reichenbach 1947, Prior 1967, Bennett & Partee 1972, Smith 1978, 1980; Kamp & Reyle 1993. In this chapter I give only a brief overview, emphasizing some of the main ideas needed to analyze the domain of temporal location.

[2] Both Dahl and Comrie argue for an approach in which 'having morphological expression' is among the features that characterize the category of tense. Comrie proposes two parameters, obligatory expression and morphological boundedness, to account for the main variants of tense, which are auxiliaries and periphrastic forms (1985:9). Dahl suggests a prototype organization for grammatical categories such as tense: "(they have) .. a core and a periphery, in the same way that an individual category does. In addition to morphological expression, features that plausibly characterize ..might include obligatory or systematic use and lack of alternative ways of expression... (this) would distinguish the English Progressive, which is obligatory in its typical uses, from e.g. the synonymous but optional and non-unique constructions in Swedish, even if both the English and the Swedish constructions are periphrastic " (Dahl 1985:23).

[3] Kamp & Rohrer develop a detailed account of temporal reference and temporal location in the framework of Discourse Representation Theory, focusing on French. In their terminology, SP refers to Speech Time; Temporal Perspective (TP) corresponds to Reference Time; Temporal Location (TL) corresponds to Situation Time. The additional time needed for successive situations is called Reference Point (RP) in their system. I have chosen to stay closer to the Reichenbach terms. Kamp & Reyle 1993 present an account of aspect and temporal location in English. In their system aspectual viewpoint and situation type are not independent.

[4] In recent syntactic structures, particularly of Government-Binding theory, tense and aspect are expressed by functional categories which have scope over most or all of the rest of the sentence.

[5] Tenses that relate to an orientation time other than Speech Time are known as relative tenses, whereas deictic tenses are absolute. Tense systems may also distinguish between near and remote past and present; for discussions of tense see Lyons 1955, 15.4, 17.2; Comrie 1985, Dahl 1985.

[6] The source of both terms is the Latin *perfectus*, the past participle of *perficere* (to carry, end, finish, accomplish). According to the Oxford English Dictionary, the term 'perfect' was first applied to the Latin tense which denoted a completed action or event viewed in relation to the present and then with qualifications to any tense expressing completed action; the first such use cited in the OED is 1530. In Slavonic studies the term 'perfective' referred to verb forms expressing completion with inflectional changes, in opposition to imperfective forms; the OED cites an 1844 address by R. Garnett to the Philological Society. Eventually this term was used to refer generally to verb forms expressing termination or completion.

[7] There is a copious traditional literature on the Perfect, ably summarized in McCoard 1978, with an emphasis on the English Perfect. McCoard notes that some scholars have claimed that the perfect is aspectual. However the perfect is always considered aspectual in a special sense, e.g. as Kuryłowicz calls it a "relative aspect" (1964:90 ff). Among traditional theories of the Perfect are those of White 1761, Pickbourn 1789; work in this century includes that of Jespersen 1931, Zandvoort 1932, Sørenson 1964, Bauer 1970.

[8] According to Iljic, what is essential for the *-guo* construction is that the events in question have taken place and that they are presented as entering the category of past events (cf p 96 et seq). To show that dates can be specified, Iljic presents examples which give by date the occurrence of the event in question:

Yijiusisi nian si yue wu ri, zheng shi Qingming jie de shihou, Yan'an Jiefang ribao dengzai-guo yi pian wenzhang, timu shi "Muqin de huiyi."

On April 14 1955, just at time of the festival of Qingming, an article entitled "Memories of my mother" appeared in the journal the Quotidian of the Liberation of Yan'an.

[9] The shifted interpretation occurs in certain syntactic contexts. When shifted, auxiliary *have* functions in lieu of the *Past* tense, which is syntactically impossible in just these contexts. For instance, auxiliary *have* but not the past tense appears obligatorily to convey pastness after modals and in infinitives, as in *Susan has been fired, Mary seems to have told Fred the news*. Cf Baker 1989:456.

[10] Locating adverbials specify Situation Time just in case Reference Time is already specified. There are several cases. The situation occurs in embedded sentences when the main sentence specifies Reference Time. Thus in *John said yesterday that Mary arrived 3 days ago*, the second adverbial specifies a Situation Time which is different from Reference Time, *yesterday*. A sentence that is semantically dependent on another for Reference Time may have an adverbial specifiying Situation Time, e.g. *John had arrived on Thursday*.

[11] There are adjectival phrases that temporally characterize situations in nominals, e.g. *Mary took a three hour walk*. In this construction the adjective seems to be of the internal type, indicating the planned or intended length of the event.

[12] The Role feature of RT accounts for the interpretation of *will* in single sentences. However, problems arise when this treatment is extended to discourse. Normally a new RT advances narrative time. But when *will* appears in embedded contexts, e.g.

(i) The Prime Minister announced that he would resign the embedded clause does not advance narrative time. Some of the peculiarities of *will* are discussed in Ogihara 1989.

CHAPTER 6

THE FORMAL ANALYSIS OF TEMPORAL MEANING

6.1 Formalizing Aspectual Concepts

The presentation of the two-component theory of aspect has focused on the basic notions and their realization in language. I now turn to formalization of the theory. In this chapter I discuss the principles and rules that are needed to associate the surface structures of sentences with their aspectual and temporal meanings. Chapter 7 integrates the analysis into Discourse Representation Theory.

The formal account of aspect must be set in a general framework for sentence meaning. The temporal schemata given above are useful for explicating aspectual notions, but they are somewhat imprecise. We want to state them formally, so that the aspectual analysis can be integrate into the representations of Discourse Representation Theory (DRT). The representations are Discourse Representation Structures, or DRSs. This chapter will provide the formal statement necessary.

Sentence meaning is represented in a DRS partly through entities of different kinds, including individuals, situations (events and states), and times. These entities appear in the representation for every sentence. Entities are introduced into a DRS as they are licensed by the meanings of the linguistic forms. In the discussion of aspectual meaning we will be concerned mainly with situation entities and temporal entities.[1]

Aspectual meaning contributes temporal information about situations to semantic representation. The aspectual components of viewpoint and situation type give information about how the situation occurs at the time specified. Viewpoint indicates how much of the situation is visible at the interval; situation type indicates the course of development that the situation takes. These temporal properties are ascribed in semantic representation to situation entities and temporal interval entities, along with their other properties.

The account given below relates the linguistic forms that convey aspect to their meanings. I consider situation type and viewpoint first as separate components and

then as they appear together in sentences. Since aspectual meaning holds of sentences, the full analysis must be given at that level. Moreover, temporal location is stated at the level of the sentence, and this factor is essential for aspectual meaning. Only as a situation unfolds in time is its aspectual character made manifest.

6.2 Situation Aspect

In this section I look more closely at the nature of the temporal properties of the situation types. I assume that all sentences contain a verb constellation, and that each verb constellation licenses a situation entity. The introduction of these entities into the structures of Discourse Representation Theory is discussed in Chapter 7. The semantic representation of a given entity will have the aspectual value associated with the verb constellation that licenses it. Situation entities have situation type characterizations as States, Activities, Accomplishments, Semelfactives, and Achievements. This is accomplished by features: the features ascribe to the entity the temporal properties that characterize a given situation type.

The temporal properties of a situation entity are intensional. They indicate how the situation unfolds in time, and can only be elucidated as a situation occurs over time. Without actual time as a backdrop the temporal properties of situations can only represent what would happen if those situations were to unfold.

Consider [Jasper run], an Activity verb constellation. The Activity situation type is dynamic, atelic, and durative. Seeking the meaning of these properties, we can find them as we watch a situation unfolding in time. Each temporal property focuses on a different aspect of the developing situation. A series of changes takes place in the course of an Activity; these changes constitute the property of dynamism. The initial endpoint involves a change from rest into the activity of running. The internal stages involve Jasper's moving his feet, etc; these stages realize the property of duration. Activities have arbitrary final endpoints, so the final endpoint of [Jasper run] is simply a stage of coming to a stop, after which there are no more stages of running. In contrast, the constellation [Jane build a sandcastle] indicates a telic event, an Accomplishment. The natural final endpoint is reached when the sandcastle is complete.

Of course at the level of situation types we abstract away from individual cases. Initial endpoints are identified as changes into a situation, internal stages as changes in which the situation is in progress, final endpoints are changes after which the situation is no longer in progress. Natural final endpoints are changes of state with have resultant states. The unfolding of Achievements and States can be set out in the same manner, mutatis mutandis.

As it unfolds, the temporal properties of a situation become manifest. With successive times such as t_i and t_j, we can identify the different stages of a situation. We may find at t_i the initial endpoint of an Activity, or at t_i an Achievement change of state. States are the same at t_i and at t_j. The statements below make such an analysis explicit and will underlie the formal account that follows.

Assuming a temporal interval at which a situation occurs, we can give a stage-by-stage account of how it unfolds in time. (1) sets out the development of the five situation types:

(1) The temporal development of the situation types (I)

a. *Activity*

t_{i-1}	t_i	$t_{i+1, etc}$	t_j	t_{j+1}
a	b	c	d	e

(a) At t_{i-1}, the situation S does not obtain; (b) t_i is the initial endpoint of S; (c) at t_{i+1} the internal stages of S develop; (d) t_j is the final endpoint of S, of the arbitrary type; (e) at t_{j+1} S does not obtain.

b. *Accomplishment*

t_{i-1}	t_i	$t_{i+1, etc}$	t_n	t_{n+1}
a	b	c	d	e

(a) At t_{i-1}, the situation S does not obtain; (b) t_i is the initial endpoint of S; (c) at t_{i+1} the internal stages of S develop; (d) t_n is the natural final endpoint of S; (e) at t_{n+1} the resultant state of S obtains. The final endpoint of an Accomplishment produces a resultant state. Whether the two stages are actually different is a delicate point. The distinction is useful for the purposes of identifying the essential properties of the Accomplishment situation type.

c. *Semelfactive*

t_{i-1}	t_i	t_{i+1}
a	b	c

(a) At t_{i-1}, the situation S does not obtain; (b) at t_i the event S occurs; (c) at t_{i+1}, the situation S does not obtain.

d. *Achievement*

i-1	t_i	t_{i+1}
a	b	c

(a) At t_{i-1}, the situation S does not obtain; (b) at t_i the change of state S occurs; (c) at t_{i+1} the resultant state of S obtains.

e. *State*

t_{i-1}	t_i	$t_{i..}$ t_n	t_{n+1}	t_{n+2}
a	b	c	d	e

(a) At t_{i-1}, the state S does not obtain; (b) at t_i is the change of state into state S occurs; (c) from t_{i+1} to t_n S obtains; (d) at t_{n+1} the change of state out of state S occurs; (d) at t_{n-2} the state S does not obtain. The changes into and out of a state are not part of the state, but are Achievement or Accomplishment events, depending on whether they are instantaneous or durative changes of state.

The courses of development presented above show how properties such as Telic and Durative can be identified as situations take place in time. They can be used to construct formal statements of the occurrence of the situation types over an interval.

(2) presents such statements of the full situations with initial and final endpoints. The situations are located an interval I, which is made up of instants t_i. The situation types S have initial and final endpoints *I, F*. Arbitrary final endpoints are identified as $S_{F(A)}$, and natural final endpoints as $S_{F(N)}$.

(2) The temporal development of the situation types (II)

a. *Activity*: Situation S obtains at interval I, with the condition that for some $t_i...t_n$, included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; and for t_n following t, $S_{F(A)}$ obtains at t_i and S does not obtain at t_{n+1}.

b. *Accomplishment*: Situation S obtains at interval I, with the condition that for some $t_i..t_n$ included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; and for t_n following t_i, $S_{F(N)}$ obtains at t_n; Resultant State R obtain, and S does not obtain, at t_{n+1}.

c. *Semelfactive*: Situation S obtains at interval I, with the condition that for some t_i included in I, S obtain neither at t_{i-1} nor at t_{i+1}.

d. *Achievement*: Situation S obtains at interval I, with the condition that for some t_i included in I, S does not obtain at t_{i-1}; Resultant state R obtains, S does not obtain, at t_{i+i}.

e. *State*: Situation S obtains at interval I, with the condition that for some $t_i...t_n$ included in I, S_I precedes t_i and S_F follows t_n.

These statements do not underlie actual sentences, because situation types require a viewpoint to make them semantically visible. The contribution of viewpoint will be discussed directly.

The properties that appear in this formal account are not precisely the ones that were used in linguistic characterizations. Detachability for instance is a property that follows from the concept of an Achievement as a one-stage event. Linguistic tests for detachability provide a good way of diagnosing a sentence as an Accomplishment or an Achievement. Here we are interested in the basic properties of the situation types and not the ways of distinguishing them that are fruitful for linguistic tests.

6.3 Viewpoint Aspect

The aspectual viewpoint of a sentence functions as an independent lens on the situation talked about. Viewpoint makes visible all or part of a situation, without obscuring the conceptual properties of the situation type. It may also contribute to conceptual meaning by giving a particular temporal perspective to a sentence. We now wish to formalize the interaction between viewpoint and situation type. The relation between the two is the key idea of the two-component theory of aspect. It is captured in part by the composite temporal schemata presented earlier: the composite schema conveys the relation by superimposing one temporal schema on another. The composite correctly shows that situation type is the locus for viewpoint, and that information is not obscured by viewpoint. The formal statement must provide for this, and for the independence of viewpoint. As we have seen, a viewpoint independent of situation type is necessary to give a coherent account of the full range of viewpoints.

Viewpoints will be given a basis by locating them at intervals of time. The intervals are specified without reference to situation type. For each sentence we specify an interval that occurs at a particular time, and a viewpoint located at that interval. The viewpoint focuses on the situation as it unfolds in time. When they actually appear in sentences, then, situation types and viewpoints occur at times in a particular interval. In this way both components of aspectual meaning are realized in terms of temporal intervals. The temporal unfolding of situations requires an interval; and this requirement meshes with that of an independent temporal interval to locate the viewpoint of the sentence in time. The temporal interval at which viewpoint is specified functions as Situation Time in temporal location.

The information conveyed by a given viewpoint can then be stated as a property of the interval. Several kinds of information may be conveyed by viewpoint: information about the situation entity which is in direct focus; information about the situation entity that is drawn from its temporal schema; information about times that extend beyond the endpoints of the situation; and in some cases the conceptual contribution of the viewpoint itself. The viewpoint is an aspectual concept which holds at the interval; it is not, of course, an entity. Consider the familiar examples of (3):

(3) a. Jane was building a sandcastle.
b. Jane built a sandcastle.

The viewpoints differ as to how much of the situation is focused: (3a) presents an internal segment of the event [Jane build a sandcastle], while (b) presents the whole event. The situation type is an Accomplishment. We will account for the interpretations by locating the viewpoints at an interval and characterizing the intervals appropriately. We will characterize the interval for (3a) as containing the imperfective viewpoint, a conceptual notion, and focussing an internal segment of the situation. To do this, we ascribe to times included in the viewpoint the appropriate properties, roughly as in 4.

(4) Characterization of the imperfective viewpoint
The viewpoint Imperfective is located at interval I; with the condition that for all times t in I, an interval of the situation S obtains, and there is no time at which the endpoints of S obtain.

In contrast, the perfective viewpoint includes the endpoints of the situation. We require that the endpoints obtain at times within the interval. (5) illustrates:

(5) Characterization of the perfective viewpoint
The viewpoint Perfective is located at interval I; with the condition that the situation S obtains at I, and there are times t_i, t_n included in I at which the endpoints of S obtain.

The neutral viewpoint focuses an interval which includes the initial point of a situation, and an initial stage. The latter provision will be vacuous for instantaneous situation types.

(6) Characterization of the neutral viewpoint
The viewpoint Neutral is located at interval I; with the condition that for some t_i included in I, situation S does not obtain at t_{i-1}, and S_I obtains at t_i; there is no time t included in I and following t_i when S_F obtains.

These characterizations require one important addition. It is crucial that viewpoint preserves situation type. To ensure this, we require the portion of S focused by a viewpoint to inherit the intensional situation type properties of the entity S. A statement to this effect is therefore added to the characterizations above: in the second clause, ". . . situation S with the properties of S."

6.3.1 Perfective Viewpoints

Perfective viewpoints varies somewhat from language to language, as we have seen. In this section I give detailed formal characterization of several perfectives. I begin with the English perfective and then note some of the main variations in the other languages considered here. The perfective viewpoint is available for all situation types in English, and is realized differently for each situation type. The information is now given in statement rather than in schema form. The perfective statement is actually an instruction for five different cases.

The perfective span is realized according to the endpoint properties of the situation type. The initial endpoints of all situations are natural. The final endpoints of Activities are arbitrary; those of Accomplishments are natural; Semelfactives and Achievements have only a single point because they are one-stage events. Results obtain only for telic events. The temporal schema of States does not include endpoints; and Stative sentences in the English perfective do not include their endpoints (cf chs 4, 8).

The perfective composite of English therefore requires five different realizations. Strikingly, they mirror the characterization of the situation types in (1). Perfective (S) means the perfective viewpoint of the situation S; S_I an initial endpoint; S_F an arbitrary final endpoint, $S_{F(N)}$ a natural final endpoint.

(7) The English perfective viewpoint
a. *Activity*: Perfective (S) presents a situation S at interval I, with the properties of S; with the condition that for t_i, t_n, included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; for t_n following t_i, $S_{F(A)}$ obtains and does not obtain at t_{n+1}.

b. *Accomplishment*: Perfective (S) presents a situation S at interval I, with the properties of S; and with the condition that for t_i t_n included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; and for t_n following t_i, $S_{F(N)}$ obtains at t_n; Resultant state R obtains, and S does not obtain, at t_{n+1}.

c. *Semelfactive*: Perfective (S) presents a situation S at interval I, with the properties of S, with the condition that t_i is included in I, S does not obtain at t_{i-1}, and S does not obtain at t_{i+1}.

d. *Achievement*: Perfective (S) presents a situation S at interval I, with the properties of S; and with the condition that t_i is included in I, S does not obtain at t_{i-1};Resultant state R obtains, and S does not obtain at t_{i+1}.

e. *Stative*: Perfective (S) presents a situation S at interval I, with the properties of S, and with the condition that S obtains continuously for t_i,t_n included in I.

Statement (e) does not include the changes of state into and out of the stative situation. These statements follow from the application of the perfective viewpoint to the different situation types.[2]

Other perfectives have somewhat different properties and different ranges, as noted in Chapter 4. The Russian, Chinese and Navajo perfectives apply only to event situation types. The French perfective presents all situation types, including States, as closed. This is stated in terms of times at which the state does and does not obtain.

(8) The French Perfective Viewpoint: Statives
a. *Stative:* Perfective (S) presents a situation S at interval I, with the properties of S,with the condition that for some t_i, t_n, included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; and for t_n following t_i, S obtains at t_n and S does not obtain at t_{n+1}.

The changes into and out of a state are events in their own right, and not strictly speaking initial and final endpoints of the state.

The Chinese perfective *-le* applies only to non-statives. It is like the others in its value for Activities and Achievements, but requires a different statement for Accomplishments. The perfective *-le* presents Accomplishments with an arbitrary final endpoint, unless a completive Resultative Verb Complement appears. The following statement holds for sentences with *-le* and no complement.

(9) The Chinese Perfective *-le*: Accomplishments
Accomplishment: Perfective (S) presents a situation S at interval I, with the properties of S, and with the condition that for some $t_i..t_n$ included in I, S does not obtain at t_{i-1}, S_I obtains at t_i; for t_n following t_i, $S_{F(A)}$ obtains at t_n,S does not obtain at t_{n+1}.

The simple perfective of an Accomplishment does not accord with the temporal schema of the situation type, because it does not necessarily include the natural final endpoint, or change of state. The *-guo* perfective is like a Perfect construction; it will not be formalized here.

6.3.2 *Imperfective Viewpoints*

Imperfective viewpoints present an interval without endpoints. They can in principle focus either preliminary, internal, or resultant, stages of situations. However, few imperfective viewpoints have maximum flexibility: most are limited to one or two of the possible spans. Imperfectives also differ in generality of application. Imperfectives may apply to all situation types, or only to a particular subset of them. The three most common types of imperfectives, distinguished according to situation type application, are the general, progressive, and resultative.

The general imperfective applies to all situation types. The progressive applies to non-stative situations. With Achievements, these viewpoints focus preliminary stages; no other interval is available for this situation type. Imperfectives do not usually apply to Semelfactives, except perhaps in backgrounding context. Recall that Semelfactive verb constellations and imperfective viewpoints are derived Activities: sentences such as *The child was knocking at the door* are taken as presenting a series of repeated knocks. The resultative applies to situations that result from a change of state; and sometimes to statives.

The general imperfective applies to all situation types; it is exemplified in our language sample by French and Russian. (4) and (5) above characterize the general imperfective but do not indicate the permissible spans. The statement in (10) allows preliminary or internal stages, assuming that the situation has such stages.

(10) General imperfective (*Imparfait*)
The viewpoint presents any situation S at an interval I, with the temporal properties of S. There is no time t in I at which S_I obtains or S_F obtains. There are no times in I, t_i, t_j, such that at t_i S obtains and at t_j S does not obtain. For all times t in I, $S_F > t$.

The requirement that the viewpoint present an interval correctly excludes Semelfactives. The final clause blocks the viewpoint for intervals after the final endpoint of the situation. This imperfective, like all others, preserves situation type information by allowing the interval focused to inherit the properties of the situation type.

The English imperfective, a progressive, is available for the event types that have intervals associated with them; it has the stage property that is associated with the dynamism of events. The Chinese imperfective *zai* and the Navajo progressive are similar. The stage property is specified as part of the viewpoint to allow for non-standard aspectual choice (see the discussion in Chapter 3).

(11) The English imperfective: progressive viewpoint
The progressive presents an interval of an event S at an interval I, with the properties of S and the property [Stage]. There is no time t in I at which S_I obtains or S_F obtains. For all times t in I, $S_F > t$.

The Navajo progressive is the same in span but is limited in application to events involving motion or a related type of action.

The resultative is an imperfective that focuses a resultant interval of a change of state. Chinese *-zhe* and the English resultative are both of this type.

(12) The resultative viewpoint
The resultative presents a situation S with $S_{F(N)}$ at an interval I. There is no time t in I at which S_I obtains or S_F obtains. For all times t in I, $S_F < t$.

The difference between the resultative and other imperfectives is that the final endpoint of the situation must precede the interval spanned. This statement ensures that the situation types focused have results by requiring that they have natural final endpoints. It would have to be modified to apply also to statives.

With some understanding of the semantic representations for aspect, we are in a position to consider how these representations arise.

6.4 From Form to Meaning: Determining the Aspectual Meaning of Sentences

I now develop compositional rules that compute aspectual meanings from linguistic forms. These rules will take sentences (more precisely, their surface syntactic structure) as input and produce semantic representations of aspectual meaning as output. The forms that convey these meanings are scattered throughout the sentence, often appearing relatively low in the syntactic tree. They need not occupy syntactic positions that directly reflect their semantic role.

Viewpoint aspect is often conveyed directly by particular linguistic forms. In many languages there are specific morphemes that indicate perfective and imperfective viewpoints. Such viewpoints are also conveyed by the zero morpheme, that is, the contrast between the presence or absence of a form. For instance, in English the simple verb form conveys the perfective viewpoint, in contrast to the auxiliary+verb form that conveys the imperfective. Neutral viewpoints have no overt linguistic form: they arise by default.

Since they constitute covert categories in language, situation types are not apparent at the surface structure of a sentence. They are not formally marked. The situation type of a sentence depends on the verb constellation, which forms a unit with syntactic ramifications in the grammar of a language. The syntactic properties and tests developed for situation types are due to this fact. The compositional analysis of verb constellations is introduced in Chapter 3.

The process of determining the aspectual meaning of a sentence can be broken down into steps, as follows:

1. Scopal structure. In surface structure the linguistic forms for situation type, viewpoint, and temporal location are distributed in the sentence. They are separated out into a scopal structure that can be analyzed. The temporal location expressions (tense, temporal adverbials) and viewpoint morpheme are separated from the verb, its arguments, and the optional adverbial of the verb constellation. This requires a determination of whether an adverbial is external or internal to the verb constellation.

2. Compositional rules compute the situation type value of the verb constellation, using the features associated with its morphemes and constituents in the lexicon.

3. The viewpoint value is determined; in English, according to whether or not the progressive auxiliary appears in surface structure.

4. Aspectual meaning is integrated into the semantic representation of the sentence, including temporal location. This section deals with the first two steps above; the analysis of temporal location is outlined in 6.5, and step 4 in Chapter 7.

6.4.1 Computing scopal structure

The scopal structure distinguishes as separate constituents the verb constellation and inner adverbial, if any, from the linguistic forms of viewpoint and temporal location. This requires calculation of whether an adverbial is internal or external (Chapter 5, section 5.4).

The crucial syntactic factor is whether a sentence has one or two adverbials of frequency or duration. Rules taking this factor into account put adverbials into the appropriate surface constituents for interpretation. The calculation depends on the number and position of the adverbial. If there is one adverbial, it is external. If there are two adverbials of the same type, one is internal and one external. If both adverbials are rightward in the sentence, the rightmost adverbial is external. If one is fronted, the rightmost adverbial is internal.

The rules in (13) put adverbials and other forms into position for analysis. The input is the surface structure of a sentence (S), the output a scopal structure (ScopS). The brace notation is used to produce a compact rule: {Adv} means that one but not both adverbials are present. X denotes the non-subject arguments of the verb; I ignore the possibility of other, irrelevant, material in the sentence. I will assume here that the sentence has the progressive auxiliary, which carries tense. (13a) says that if there is one adverbial, it is external to the verb constellation in scopal structure. (13b) says that if there are two adverbials of different types, they are external to the verb constellation; (13c-d) say that if there are two adverbials of the same type (α), one is internal to the verb constellation in scopal structure.

(13) Rules for Scopal Structure

a. $_{S}$[{Adv} NP be+tense V+ing X {Adv}] →
$_{ScopS}$[[tense [Adv] [Prog $_{VCon}$[NP V B]]]

b. $_{S}$[NP be+tense V X $_{Adv}$[α] $_{Adv}$[β]] →
$_{ScopS}$[tense $_{Adv}$[α]$_{Adv}$[β] [Prog $_{VCon}$[NP V X]]]

c. $_{S}$[NP be+tense V X $_{Adv1}$[α] $_{Adv2}$ [α]] →
$_{ScopS}$[tense $_{Adv2}$ [α] [Prog $_{VCon}$[NP V X $_{Adv1}$[α]]]]

d. $_{S}$[$_{Adv1}$[α] NP be+tense V X] $_{Adv2}$[α]] →
$_{ScopS}$[tense $_{Adv1}$[α] [Prog $_{VCon}$[V X $_{Adv2}$ [α]]]]

The output of these rules is a scopal structure that can be interpreted for aspectual value and temporal location.

6.4.2 Compositional rules for situation type

The compositional rules for basic-level situation type operate on the verb constellation. The rules are interpretive, associating a situation type feature with a verb constellation. Rules for derived situation types follow, and include information outside the verb constellation.

The particulars of compositional rules vary according to the language in question. In English, French, Chinese, the basic verb is a morpheme or morpheme unit. In Russian the verb and certain prefixes constitutes the basic unit; other verb prefixes are part of the viewpoint system. In Navajo the basic unit for is the verb base. The structure of NPs also differs. Yet it is striking that the basic factors are the same across languages. I give rules for English; see the chapters of Part II for comments on rules in other languages.

Intrinsic features: The assignment of intrinsic features is discussed in Chapter 3, section 3.3.1. Verbs are assigned an intrinsic aspectual value in the lexicon.

Prepositions: English verb particles are relevant to aspectual value. Certain particles change aspectual value, others do not. The aspectual value of a verb usually changes from telic to atelic with a particle, if it changes at all. The examples illustrate:

(14) Particles that change aspectual value

read [Telic]	read in [Atelic]
chip [Telic]	chip away [Atelic]

(15) Particles that do not change aspectual value

stand	stand up
wash	wash down

Particles like those in (15) commonly appear in telic constellations, emphasizing the telic nature of the event. See Chapter 8.

NPs: The essential feature of NP arguments is whether they are quantized and finite, or cumulative and non-finite. Proper names are quantized; pronouns depend on their antecedents. Common nouns are categorized in English as [+count] or [+mass], according to their appearance in diagnostic syntactic contexts. Count nouns appear with specifiers such as articles, plurals, and certain quantifiers; mass nouns appear with quantifiers such as *some, every,* do not take plurals, appear in bare NP's. Both appear with determiners.

Most nouns can appear as members of both categories, as emphasized by Pelletier & Schubert 1987. If a noun such as *apple* appears with an article, or plural, the NP is [+count]; in a bare NP construction *apples*, the NP has the [+mass] feature. Mass

nouns are flexible also: cf *flour* in the NP *the 5 flours in this cake*, the NP has the value [+count]. The notion of basic-level categorization is relevant to multiple categorization of nouns, as well as verbs. Most nouns are count or mass at the basic-level categorization. For instance, *red* and *flour* are mass nouns at the basic level, while *dog* and *apple* are count nouns at that level. The analysis of *apple* as a mass noun and *flour* as a count noun is similar that of the shifted and derived categories of verb constellations.

I give below a group of rules that compute the aspectual value of a verb constellation from scopal structure. Their output is a complex semantic feature assigned to the verb constellation. The feature will characterize the situation entity introduced into the semantic representation of Discourse Representation Theory. Basic-level must be distinguished from derived-level categorization; the latter involves material external to the verb constellation.

The rules do not exhaust either the syntactic structures of English nor the full range of situation type categorization. They are intended to cover some important cases and to illustrate some of the issues that arise in formal statements. I state rules for a simple NP subject, a verb, an optional object NP argument and a single adverbial. Features are specified only if they affect the computation of situation type. Optional elements are indicated with parentheses.

The rules specify those features of a sentence that are relevant to the situation type they compose. For instance, Rule (1a) composes a simple Activity with an atelic verb. Sentences with such verbs are atelic whether or not the subject NP is quantized: *Susan laughed* and *People laughed* are both atelic. Therefore the rule does not specify a feature for the subject NP.

Nouns are listed as count or non-count, prepositions as telic or atelic, prepositional phrases as locative or directional, adverbials as frequentative, durative, or completive. Other types of adverbials do not figure in this computation of situation type, although a full account would have to include compatibility between manner adverbials, situation type, and viewpoint. Abbreviations: Telic=Tel, Atelic=At, Dynamic=Dyn, Durative=Dur, Instantaneous=Inst, Stative=Stat, Act=Activity, Accomplishment=Acc, Ach=Achievement, Sem= Semelfactive, Locative=Loc, Frequentative=Freq, Completive=Cmpl, Directional=Dir, Particle=Prt, Count=Ct, Noncount=NCt, Progressive=Prog, Perfective=Perf, Viewpoint=View, Scopal Structure=ScopS, Derived Verb Constellation=DVCon.

Activity: There are three types of basic-level Activity verb constellations: (a) Atelic, durative verbs and compatible complements, such as particles and adverbials that are not telic; (b) Telic, durative verbs and atelic particles, with subject and other arguments; (c) Telic, durative verbs and at least one uncountable argument. It is necessary to state a different rule for each type of Activity. The inputs are verb constellations with different internal structures (I abstract away from the full scopal structure). The outputs are the verb constellations interpreted with the semantic feature 'Activity':

Activity rules: $_{VCon}$[X Y Z] → $_{VCon}$[Activity]

The feature [Activity] represents the features [Dynamic], [Atelic], [Durative] which

characterize the Activity situation type. Each rule is followed by examples of verb constellations that it interprets.

Rule (1a) Atelic verb
$_{VCon}$ [[NP] $_{V}$[At, Dur] ($_{Prt}$[At]) ([NP]) ($_{PP}$[Loc])]
→ $_{VCon}$[Activity]
[Susan laugh] [Susan push a cart] [Susan stroll in the park]

(Rule 1b) Telic verb and atelic particle
$_{VCon}$[[NP] $_{V}$[Tel, Dur] $_{Prt}$[At] ([PP) $_{PP}$[Loc]]
→ $_{VCon}$[Activity]
[Peter read in *War and Peace*] [Susan work on the report]

(Rule 1c) Telic verb and uncountable argument NP
$_{VCon}$[[NP] $_{V}$[Tel, Dur] ($_{NP}$[NCt]) ($_{PP}$[Loc])]
→ $_{VCon}$[Activity]
[Peter eat apples] [Guests visit that clinic]

This rule identifies the uncountable NP as the object. Special notation would be needed for a single statement of all the possibilities.

Derived-level Activities: One class of derived Activity consists of a telic or instantaneous verb constellation and an external durative adverbial. The value of the adverbial overrides that of the verb constellation. The input to the rule is a scopal structure with an external adverbial and an interpreted verb constellation; the output is a derived verb constellation with the external adverbial in its scope. The rule applies to Accomplishment, Semelfactive or Achievement verb constellations. The derived structure indicates the basic-level verb constellation.

(Rule 1d) Accomplishment verb constellation with durative adverbial
$_{ScopS}$ [X $_{Adv}$[Dur] [$_{VCon}$[Acc/Sem/Ach]]
→ $_{ScopS}$[X $_{DVCon}$[Activity [$_{VCon}$[Acc/Sem/Ach]]]]
[Mary write a letter for five minutes] [I knock at the door for an hour]

A second type of derived Activity consists of a basic-level verb constellation and the progressive viewpoint; durative adverbials may appear. Sentences of this type represent a marked aspectual choice.

(Rule 1e) Derived: Stative constellation with dynamic syntax
$_{ScopS}$ [tense ($_{Adv}$[Dur]) [Prog [$_{VCon}$[Stat]
→ $_{ScopS}$[tense ($_{Adv}$[Dur]) [Prog $_{DVCon}$[Act [$_{VCon}$[Stative]]]]
[The river be smelling bad these days] [I be loving this walk]

Accomplishment: The two main basic-level Accomplishment constellations have telic, durative verbs and countable arguments; or atelic, durative verbs and a directional complement.

(Rule 2a) Telic verbs and countable argument
$_{VCon}[_{NP}[Ct]\ _{V}[Tel, Dur]\ (_{NP}[Ct])\ (_{PP}[Loc])\ ]$
$\rightarrow\ _{VCon}[$ Accomplishment]
[Mary build a sandcastle] [John stand up]

(Rule 2b) Atelic verbs and directional complement
$_{VCon}[_{NP}[Ct]\ _{V}[At, Dur]\ (_{NP}[Ct])\ (_{PP}[Dir])\ ]$
$\rightarrow\ _{VCon}[$ Accomplishment]
[They walk to school] [Sylvia built a house]

Derived-level Accomplishments: Accomplishments of this have completive adverbials and Activity verb constellations, which are not standardly compatible. The aspectual value of the adverbial overrides that of the constellation.

(Rule 2c) Activity verb constellation and completive adverbial
(i) $_{ScopS}$ [tense $(_{Adv}[Cmpl])$ [View $[_{VCon}[Act]]]$
$\rightarrow\ _{ScopS}[tense(_{Adv}[Cmpl])\ [View\ _{DVCon}[Acc\ [_{VCon}[Act]]]]]$
[John exercise in an hour] [Mary strolled in the park in an hour]

Semelfactive: Verbs with the features atelic, instantaneous, combine with a countable argument in verb constellations of this type.

(Rule 3a) Atelic, instantaneous verb and countable argument(s)
$_{VCon}[_{NP}[Ct]\ _{V}[At, Inst]\ (_{NP}[Ct])]$
$\rightarrow\ _{VCon}[$Semelfactive]
[The child clap his hands] [Bill hiccup] [The bird flap its wing]

Achievement: Verbs with the features telic and instantaneous combine with a countable argument in verb constellations of this type.

(4a) $_{VCon}[_{NP}[Count]\ _{V}[Tel, Inst]\ (_{NP}[Count])]$
$\rightarrow\ _{VCon}[$Achievement]
[Mary win the race] [I awoke] [He found the watch]

Stative: Constellations in which the verb has the feature State are stative. The constellation must have the perfective viewpoint.

(Rule 5a) Stative verb constellations
(i) $_{ScopS}$ [tense X $[_{View}[Perf]\ [_{VCon}[NP\ _{V}[Stat]\ X\ ]]]$
$\rightarrow\ _{ScopS}[\ldots\ [_{VCon}[Stative]]]$
[Ed hates broccoli] [We believe the world is flat] [Mary is a doctor]

Derived statives: All verb constellations become habitual statives in the context of a frequency adverbial. I ignore the case where the habitual reading arises pragmatically. The habitual stative reading arises in present tense event sentences with the perfective viewpoint.

(5b) Frequency adverbial habitual statives
$_{ScopS}$ [tense $_{Adv}[Freq]$] [View [[VCon]]
$\rightarrow\ _{ScopS}[tense_{Adv}[Freq]\ [View\ _{DVCon}[Stat\ [VCon]]]]$
[Tom is often in love][Dad plays bridge on Sundays[

(5c) Present tense perfective habitual statives
$_{ScopS}\ [_{tense}[Pres]\ [_{View}[Perf]\ _{VCon}[Dynamic]$
$\rightarrow\ _{ScopS}\ [\ \ldots\ _{VDCon}[Static]_{VCon}[Dynamic]]]$
[Mary feeds the cat] [John opens the mail]

This completes the rules for determining situation type. I do not give rules for viewpoint aspect interpretation, since it is entirely straightforward according to the verb form. I now turn to the calculation of temporal location.

6.5 Determining the Temporal Location Meaning of Sentences

The temporal information in a sentence allows the interpretation of the three times needed for temporal location.[4] The calculation is carried out by rules, as introduced in Chapter 5.

The principles for temporal location interpretation of simple, independent sentences are summarized below; I then illustrate with several rules that determine interpretation from scopal structure.

- Three times are introduced for every clause: Speech Time or SpT (t_1), Reference Time or RT (t_2), Situation Time or SitT (t_3).
- Tense indicates the relation of RT to SpT. For the past tense, for instance, RT precedes SpT: RT < SpT ($t_2 < t_1$).
- Locational adverbials specify RT in conjunction with tense, if tense and adverbials do not clash in relational value.
- When tense and adverbials have the same relational value, there is no independent SitT: SitT=RT ($t_3 = t_2$).
- When tense and adverbials clash in relational value and the tense is present, the adverbial determines the relation between SpT and RT.
- When tense and adverbials clash in relational value and the tense is past, RT cannot be established; the adverbial indicates the relation of SitT to RT.

I now present rules for interpreting SpT, RT, and SitT in independent single-clause sentences. Only relational value features are mentioned, because issues of Role and Orientation do not arise for such sentences. The relational values of temporal expressions are given directly, or indicated with the alpha notation. I use the scopal structure format. The left-hand side gives the temporal expressions and configuration of scopal structure; the right-hand side gives the temporal interpretation. Only adverbials of the Locating type are included (notated as LAdv). X, Z indicate other material.

Same relational values: Tense alone indicates the relation RT to SpT. When the rela-

tional values of tense and adverbial are the same, they specify RT, and SitT=RT, as shown in (48) of Chapter 5. If auxiliary *have* is present, SitT < RT (ignoring the shifted use of *have*). Example sentences and interpretations are given for each rule.

(Rule 6a) $_{ScopS}[\ X\ _{Tns}[\alpha] + Z\ (_{LAdv}[\alpha])\ [VCon] \rightarrow$
$_{ScopS}[\ RT\ \alpha\ SpT,\ (RT = Adv);\ SitT=RT]\ [VCon]$

i. The doctor is ready now.
[RT=SpT, RT=now, SitT=RT]

ii. The Prime Minister resigned last week.
[RT < SpT, RT=last week; SitT=RT]

iii. The secretary will arrive tomorrow.
[RT>SpT, RT=tomorrow, SitT=RT]

(Rule 6b) $_{ScopS}[\ X\ _{Tns}[\alpha] + have\ Y\ (_{LAdv}[\alpha])\ [VCon] \rightarrow$
$_{ScopS}[\ RT\ \alpha\ SpT,\ RT = Adv;\ SitT < RT]\ [VCon]$

i. John and Mary have gone to the movies.
[RT = SpT, SitT<RT]

ii. The secretary had arrived yesterday.
[RT<SpT, RT=yesterday, SitT<RT]

iii. The Prime Minister will have resigned.
[RT>SpT, SitT<RT]

Different relational values: When tense and adverbial have different relational values, we need a rule for each tense. If the tense is present, RT is specified by the value of the adverbial: the adverbial overrides the tense.

(Rule 6c) $_{ScopS}[\ X\ _{Tns}[Pres] + Z\ (_{LAdv}[\alpha])\ [VCon] \rightarrow$
$_{ScopS}[\ RT\ \alpha\ SpT,\ (RT = Adv);\ SitT=RT]\ [VCon]$
then $_{S}[\ RT\ \beta\ SpT,\ Adv = RT,\ SitT=RT$

i. Mary leaves tomorrow.
[RT > SpT, RT=tomorrow, SitT=RT]

ii. Last week, this guy tells me that he is a famous criminal.
[RT < SpT, RT=last week, SitT=RT]

(i) and (ii) exemplify the Futurate and the Historical Present respectively. The Historical Present arises in particular narrative contexts; the Futurate indicates a Future time from the perspective of the Present (see Chapter 9).

If the tense is past and the adverbial has a different value, RT is not established in the sentence. The clause cannot be fully interpreted without additional information. The adverbial locates SitT relative to RT; but the actual SitT cannot be calculated.

(Rule 6d) $_{ScopS}[X\ _{Tns}\ [past] + [Z]\ (_{LAdv}[\alpha])]$
$\rightarrow\ _{ScopS}[RT—,\ SitT\ \alpha\ RT,\ Adv=SitT]$

(i) John was tired now.
$_{S}[RT—;\ SitT=RT,\ now]$

(ii) John was leaving in 3 days.
$_{S}[RT—;\ SitT>RT,\ 3\ days]$

The dashes indicate that the information in the sentences does not establish RT. RT may be established by a syntactically independent sentence; by a main clause, if it is in a complement clause; or by a second adverbial (as in *Last Tuesday, John was leaving in 3 days*). The rule for interpreting such clauses associates the leftmost adverbial with RT and the rightmost adverbial with SitT.

We now have a good understanding of how information about temporal location and aspect is determined. In Chapter 7 we consider how this information is represented in the structures of Discourse Representation Theory.

Notes

1 Entities in Discourse Representation Structures are discussed in Chapter 7. See also Kamp & Reyle 1993.

2 In discourse, perfective Activity sentences are more flexible than this. They present an implicitly bounded Activity event; the endpoints may but need not coincide with the initial and final endpoints of the situation schema (Smith 1996).

3 Krifka shows that the aspectual value of a verb constellation is the result of semantic operations on the parts (1987, 1989).

4 In rules that account for both simple and complex cases, SpT is the default for an Orientation Time, OT.

CHAPTER 7

ASPECTUAL MEANING IN DISCOURSE REPRESENTATION THEORY

In this chapter I discuss the formal semantic implementation of the two-component approach to aspect. The analysis is set in the framework of Discourse Representation Theory.[1] The theory provides a rigorous semantic interpretation at the level of mental representation. It is ideally suited for the domain of aspect because it at once develops a conceptual representation and a truth-conditional interpretation. As we have seen, the contribution of conceptual meaning is essential in accounting for aspect. Discourse Representation Theory constructs an ongoing, dynamic representation of discourse, in which the meaning of a sentence contributes to the meaning of the text or discourse. The theory deals with semantic and pragmatic information, including information due to inference.

I begin with some general remarks about semantics and then give a brief introduction to Discourse Representation Theory. The formal analysis of aspect begins in section 7.2.

7.1 Meaning and Language Understanding

The study of meaning begins with questions about what meanings do and what they are used for, according to the philosopher David Lewis (1972:173). Since Lewis's seminal article, formal semantics has developed two kinds of answers to such questions about meaning. In truth conditional semantics, truth conditions alone are the key to meaning: the meaning of a sentence is that which determines the conditions under which the sentence would be true. Another approach claims that meaning is what receivers grasp when they understand a sentence (Kamp 1985) and uses representations that formulate mental models of understanding. The two approaches are com-

plementary, each accounting for an important aspect of language. The semantic theory known as Discourse Representation Theory combines the important features of both. Discourse Representation Theory (DR theory) gives a systematic procedure for constructing semantic representations, together with a definition of truth.[2] The constructs of DR theory are intended to represent the receiver's understanding of a text or discourse.[3]

There is reason to suppose that when people receive a text they construct a mental model, as psychologists Johnson-Laird and Garnham have argued convincingly (1980, 1983, 1985). The model contains the individuals, events, properties and relations that are licensed by the text, and that are required to understand it.[4] (I will use 'text' to refer to single sentences as well as larger units.) We can think of semantic representation as a construct that represents the mental model of a text. The representation gives the conceptual meaning of a text. Conceptual meaning is closely related to truth conditional meaning but not identical with it. The mental models approach is well-established in psychology, linguistics and artificial intelligence. It has proven to be essential in the development of theories of text comprehension. The semantic representations of DR theory correspond closely to the notion of mental models.

In the mental models approach, a sentence licenses the introduction of certain entities in a semantic representation. The entities represent the individual concepts that are explicit in the sentence. The concepts include entities representing the events and states presented in the sentence, that is, situation entities. The semantic representation of a situation indicates, among other things, what individuals it involves and their roles as participants. Thus the English sentence *Susan cooked a fish* licenses individuals corresponding to *Susan* and *a fish*; the situation entity [cook (x, y)]; and the information that x is the agent of *cook*, and the individual Susan; while y is the theme or patient of *cook*, and the individual a fish.

Language understanding is the process through which the receiver arrives at the meaning of a discourse. It results in the receiver's grasping the information conveyed in the discourse. Discourse meaning can be represented with a dynamic model of this information. The models represent the entities, properties and relations that are presented in a discourse. From this point of view a discourse can be seen as a set of instructions to introduce entities and properties in one's mental model. It is reasonable to assume that receivers construct such models, or something that corresponds to them. People's actual representations may not take precisely the form of a particular theory, of course. But there is some support from work in linguistics, psychology, and cognitive science that supports such representations as those of DR theory.

As discourse is dynamic, so representations must be also. In a sequence of sentences, or utterances, new entities are added, old entities are referred to, situations change. In short, one's representation must be constantly updated. A detailed account would include negation, questions, imperatives, and would allow for the receiver to accept, query, or reject new material. This discussion however is confined to assertions; Kamp 1985 considers some of the other issues.

The embedding of sentences in a formal, dynamic model emphasizes the fact that the meaning of a sentence is always context-dependent. Traditionally linguists have been aware that certain forms have a consistent but shifting interpretation that depends on context. Pronouns such as *I, you, they*; demonstratives such as *this, that*;

adverbials such as *here, there*; past, present, and future tenses are good examples. These are known as deictic or indexical terms; the former term is linguistic, the latter appears primarily in the philosophical literature. Deictic terms relate an utterance to the context (cf Benveniste 1956, Jakobson 1957, Fillmore 1971). The interpretation of these forms is necessary to sentence understanding. One must be able to locate the reference of a pronoun, and to determine the spatio-temporal coordinates of the context.

There are other, more subtle types of contextual dependency that have been appreciated increasingly as formal semanticists work out the truth conditions for sentences and construct models that represent sentence meaning. It is necessary to specify precisely how reference is made, how information is picked up from context. Often to understand what is conveyed the receiver must deal with omissions and ellipses. To do this people rely on world knowledge, conversational principles, and on specific contexts: on a common ground of knowledge that is difficult if not impossible to specify exhaustively. As one is forced by rigorous semantic theories to specify precisely certain meanings that are indexical, elliptical, and vague, it becomes clear that understanding a single sentence, or a complex discourse may involve a great deal of information that is not explicitly given in the sentence. The notion of common ground (Stalnaker 1972) sums this up. Receivers of a sentence bring common knowledge of context to its understanding; and when they have understood it, the sentence becomes part of the common context. Thus, in Stalnaker's formulation, each new sentence increments the context.

In any account of discourse the sentence remains an important linguistic unit. Many linguistic rules operate on sentences: they are the primary linguistic units for syntactic, morphological, and phonological analysis. They are also the units for basic semantic notions as thematic roles, events and states, adverbial modification; and for some interpretive rules for reflexivization and other types of anaphora. Semantically and pragmatically, however, a sentence is simply a minimal discourse.

The abstract meaning of a sentence is determined by its individual words and the way they are combined, using the principle of compositionality. According to this principle the meaning of an expression is composed by rule from the meanings of its parts. The rules are intended to account consistently for the grammatical meaning of sentences, abstracting away from lexical semantics. For instance, the sentence *Every man loves a woman* should have the same semantic account as the sentence *Every noise annoys an oyster*: both are ambiguous in the same way (Dowty, Wall & Peters 1981:11). The meanings determined by compositional analysis are the input to truth-conditional semantic rules.

The basic idea of the truth conditional approach is that the abstract meaning of a sentence can be identified with the actual or possible situations in which the sentence is true.[5] Truth-conditional semantics is expected to provide a description of how things would have to be in order for a sentence to be true. The description includes the entities, properties, and relations that are talked about in the sentence. Truth-conditional semantics is often carried out with the use of a formal model. A model of the world is constructed which contains things corresponding to the entities, properties and relations talked about in sentences. Correlations between a particular state of affairs and a sentence are stated with functions.

7.2 Discourse Representation Theory

Discourse Representation Theory models the dynamic semantic structure of a discourse that changes as the discourse unfolds. The theory develops a representation of the information that a discourse conveys, including non-truth conditional aspects of discourse meaning. The representation is evaluated truth conditionally with a mapping of the representation to a model-theoretic construct. There are, therefore, two distinct levels of semantic analysis. It is an essential feature of the theory that the representation of discourse meaning is distinct from its truth conditional evaluation.[6]

At the first level is the Discourse Representation Structure (DRS) itself. DRSs are constructed by rule from the syntactic analysis of sentences. They are semantic representations of what the receiver grasps in understanding a discourse. Reference markers are introduced in each of the entities to which reference is made in the discourse, including events. Information about the entities is stated in the form of predications, or conditions, which may impose internal structure on the DRS. The DRS may include complex conditions which make certain entities unavailable as antecedents for anaphoric reference.

At the second level DRSs are interpreted within a formal model. The model is an information structure, a domain of individuals of various kinds. As expressions of a language can be evaluated relative to a model, so DRSs can be evaluated. To assert a sentence amounts to asserting that the world or the model accords with the picture in the DRS: that there is a correct mapping from the reference markers of the picture to the world itself. To evaluate a sentence, we ask which individuals in the model satisfy the predicates. Through rules of functional application sentences are assigned a denotation, or meaning, in a model, which corresponds to the way some state of affairs might be. In framing conditions and models it is not possible to put everything in. The analysis focuses on certain situations, entities, location, and times; the rest is taken for granted. Thus the models specified are partial models. DR theory has a truth-conditional component which implements this approach.

Analysis in the DRS framework shows dramatically that a sentence cannot be detached from the discourse context in which it appears. The theory has contributed insights about indefinite reference, anaphora, attitude and belief statements, temporal reference and aspect.

The conceptual structures of DR theory enable an account of those aspectual meanings that are not truth conditional. I have stressed that aspectual meanings shape the presentation of a sentence, and that the choices in most languages allow considerable latitude. Aspectual meaning is a domain in which rhetorical meanings are paramount, taking the term 'rhetorical' in the sense of presentation. Speakers choose aspectual meanings in order to present situations from a certain point of view: they use the meanings grammaticized in a given language to give a particular focus or emphasis, including the neutral, to their presentation. The choices are not entirely unconstrained: they are limited by conventional categorization, conventions of use, and truth-conditional differences. Nevertheless there is a very clear sense in which the aspectual meaning of a sentence reflects the speaker's decision to present material in a certain way.

Some aspectual concepts have truth-conditional force, others do not. The former have explicit consequences in the world or in a model: they determine the situations

to which the concepts refer. The latter type of concept shapes presentation; it need not correspond in a one-to-one manner to modeled or actual situations. One hallmark of the domain of aspect is the fact that both types of concepts are available to speakers. As we have seen, the choices inherent in aspectual systems allow speakers to talk about situations in various ways. Events may be presented as states, and states as events. The speaker may telescope or extend the duration of a situation. Yet certain properties, such as [Telic], are not available to this type of marked aspectual choice: they are essential to the very notion and identification of a situation. The properties with truth-conditional force remain constant in shifts from standard to marked aspectual value. The distinction between truth-conditional and primarily conceptual meaning corresponds quite closely to that of standard and marked aspectual choice.

DR theory provides the locus for aspectual concepts, and shows how they take their place among other concepts, especially temporal ones. The notion of discourse meaning crucially includes the idea that the way information is presented may contribute to its meaning. The presentation of discourse includes lexical and syntactic structures, the order and focus in which events are presented. The structures of DR theory allow us to explicate this literary and linguistic truism. In the structures of DR theory discourse meaning is constructed with the same precision as the meanings of an exclusively truth-conditional semantics.

7.3 Discourse Representation Structures

The aspectual meaning of a sentence is represented in a Discourse Representation Structure in the form of conditions on the situation entity for that sentence, and on the time at which it is located. Situation entities are introduced into the DRS for each sentence, with the aspectual interpretation determined by compositional rules; temporal location expressions introduce times and their relation. This discussion is limited to simple sentences; complex sentences have several verb constellations, each with an aspectual meaning. I discuss the DRSs for a few representative sentences and show how the DRSs arise through the construction algorithm of the theory.

7.3.1 Aspectual meaning in Discourse Representation Structure

The verb constellation of a sentence licenses the introduction of a situation entity [e] in the DRS. Square brackets indicate DRS entities. The situation entities are characterized in the DRS in situation type terms. There is a condition on each situation entity characterizing it as a member of the class of Accomplishment, Achievement, Semelfactive, Activity, or Stative situation types. In this way the situation entity is endowed with the temporal features of its situation type.

The temporal features have a procedural force in sentence interpretation. For instance, if an event has the property [Telic] and its endpoints are visible in a sentence, one infers that the event has a natural final endpoint, rather than an arbitrary final endpoint or external bound. Again, if an event with the property [Instantaneous] is presented with the imperfective viewpoint, one infers that the imperfective focuses a preliminary interval.

The Accomplishment sentence *Mary crossed the street* would have in its DRS the information in (1):

(1) Situation type information for *Mary crossed the street*
[e] (cross, x y)
e ∈ {Accomplishment}

The curly brackets are used to indicate intensional properties associated with [e]. The individuals [x] and [y] are identified as *Mary* and *the street*. The situation type value of the verb constellation is determined by the compositional rules given in Chapter 6.

Viewpoint makes visible truth-conditional information about a situation, and has its own conceptual meaning in presenting a situation from a given perspective. Viewpoint also affects the interpretation of a sentence by triggering conventions of use. The contribution of the viewpoint is modeled in the DRS through the temporal interval, [I], introduced with every sentence. Aspectual viewpoints are located at [I]; the information they make visible is specified as a property of the interval. In this treatment viewpoint is independent of situation type. As we have seen, such independence is necessary, partly because of the range of possible viewpoint spans. The independence of [I] allows for viewpoints that have a span larger than the entity which they focus. It is also necessary in accounting for the dynamic temporal information of sentences; see Kamp & Rohrer 1989.

The viewpoint morpheme will trigger the introduction of an interval [I] into the DRS. Associated with each viewpoint is its formal characterization, that is, a statement of what portion of a situation it makes visible. The information made visible by the viewpoint appears in the DRS as a characterization of the interval [I], given in terms of the endpoints and/or internal stages of [e]. For instance, the sentence *Mary crossed the street* presented in (1) above has the perfective viewpoint. Since the perfective viewpoint includes the endpoints of events, the initial and final endpoints of [e] are visible; they are indicated by I(e) and F(e) respectively. [I] consists of instants, the first of which is [t_i], the last of which is [t_j].[7] The instant [t_i] occurs at I (e), and the later instant [t_j] occur at F(e). The contribution of viewpoint for this sentence appears in a DRS roughly as in (2):

(2) Viewpoint information for *Mary crossed the street*
{Viewpoint (I, e) = Perfective}
$t_{i,j} \in I$
$t_i = I$ (e), $t_j = F$ (e)
$t \in I$, $t \geq t_i$, $t \leq t_j$

Perfectives and imperfectives differ in the concepts that they introduce, in other words, in point of view. The concept of the viewpoint is part of the information presented in the sentence. The viewpoint concept is set off with curly brackets to indicate its special status, like the aspectual characterization of a situation entity.

The interval [I] is a temporal entity. It is located at a time introduced by the temporal expressions of a sentence, [t_3]; this time functions as Situation Time in the interpretation of the temporal meaning. If not temporally located by an adverbial, [I] is an

interval that is large enough for the information made visible by viewpoint. If an adverbial specifies an interval - *yesterday, last week* - the visible information must fall within that interval.

In what follows I gradually develop a DRS with full aspectual and temporal information. Consider the sentence *Mary laughed.* Compositional rules determine that the verb constellation [Mary laugh] denotes a situation of the Activity type. The situation entity [e] is introduced into the DRS with the intensional aspectual properties associated with an Activity. The verb constellation also introduces the individual entity [x], which is associated with Mary in the DRS.

(3) a. Mary laughed.

b. preliminary DRS

e x
1. e = [Mary laugh] 2. e ∈ {Activity} 3. x = Mary

The entity [e] receives the intensional characterization {Activity}: it belongs to the class of Activities. Recall that members of this class have the temporal features [+Dynamic], [+Atelic] and [+Durative]. The property [+Atelic] means that [e] has initial and final endpoints, and that the final endpoint is arbitrary. The property [+Durative] means that there is an interval of at least one instant between the initial and final endpoints of [e].

The viewpoint of the sentence is located at an interval [I], which is introduced as a temporal entity in the DRS, together with times [$t_{i,j}$]. The interval [I] is located at a time specified by the temporal location expressions of a sentence as SitT [t_3]. The interval [I] is characterized by the aspectual viewpoint of the sentence, which has both conceptual and truth-conditional values. Viewpoints make visible all or part of a situation entity; whatever is visible has truth-conditional force. The example ***Mary slept*** has the perfective viewpoint, which includes the initial and final points of a situation.

The perfective viewpoint is specified at the interval in terms of the stretch of [e] that it makes visible. The viewpoint of [e] at [I] is Perfective. and includes the endpoints of events. Thus the DRS must specify that [I] includes the initial and final points of [e], I(e) and F(e) respectively (line 3 below). [I] consists of instants; the specification locates an instant [t_i] at I(e), and a later instant [t_j] at F(e). Since [e] has duration, its internal stages are also visible: there is at least one time [t] in [i] that follows [t_i] and precedes [t_j], [$t_{i,j} \in$ I]. At these times [e] is in progress: they are stages of [e].

(4) Aspectual DRS for *Mary laughed*

I e x t_i t_j
1. e = [Mary laugh]
2. e ∈ {Activity}
3. {Viewpoint (I, e) = Perfective}
4. $t_{i,j} \in$ I
5. $t_i = I$ (e), $t_j = F$ (e)
6. t ∈ I, $t \geq t_i$, $t \leq t_j$
7. x = Mary

We now add information about temporal location to the DRS.

7.3.2 Temporal Location in Discourse Representation Structures

Temporal information appears in the DRS in the form of temporal entities and conditions, following the analysis of Chapter 5. Three temporal entities, [t_1], [t_2] and [t_3], are introduced for every sentence. The temporal entities correspond to Speech Time (t_1), Reference Time (t_2), Situation Time (t_3). The relations of these entities to each other is given by the syntax and temporal expressions of the sentence. Conditions in the DRS locate the entities and give their relations to each other and to [e], the situation entity.

Temporal expressions license entities and conditions in a DRS. Tense and adverbials indicate the relation between Speech Time (SpT) and Reference Time (RT), and specify RT or SitT. In simple sentences, RT and Situation Time (SitT) are simultaneous, and SpT is the default for [t_1]. The tenses of a given language have associated features that contribute to interpretation.[8] Adverbials too have associated semantic features that give their relational, deictic, and aspectual values. The interval [I], introduced with each clause, is located at SitT[t_3].

The algorithm for constructing a DRS from a sentence applies to the output of rules which interpret the temporal information in the sentence. The rules were given in Chapter (6). The algorithm introduces entities and conditions licensed by the temporal expressions and syntax of the sentence.

(5) adds temporal information to the DRS for the sentence we have been working with. The viewpoint [I] is located at [t_3] (line 7). The past tense of the example gives both the relation between [t_2] and [t_3], and the information that [t_2] precedes Speech Time, [t_1].

(5) temporal and aspectual DRS for *Mary laughed*

t_1 t_2 t_3 I e x t_i t_j
1. e = [Mary laugh]
2. e ∈ {Activity}
3. {Viewpoint (I, e) = Perfective}
4. $t_{i,j} \in$ I
5. $t_i = I$ (e), $t_j = F$ (e)
6. t ∈ I, $t \geq t_i$, $t \leq t_j$
7. I at t_3
8. $t_3 = t_2$
9. $t_2 < t_1$
10. x = Mary

The next example illustrates a sentence with the past tense and a past time adverbial. The adverbial specifies RT.

(6) a. Xavier played his flute yesterday.

b. Aspectual and temporal DRS

t_1 t_2 t_3 I e x y $t_{i,j}$
1. e = [Xavier play his flute] play (x,y)
2. e ∈ {Activity}
3. {Viewpoint (I, e) = Perfective}
4. $t_{i,j} \in$ I
5. $t_i = I$ (e), $t_j = F$ (e)
6. t ∈ I → $t \geq t_i$, $t \leq t_j$
7. t_2 = yesterday
8. $t_3 = t_2$
9. I at t_3
10. $t_2 < t_1$
11. x = Xavier
12. y = his flute

Syntactic structure is relevant to the interpretation of temporal expressions in a given sentence. Tense and adverbials function differently in embedded clauses and in main clauses. In main clauses tense is oriented to SpT and adverbials specify RT, except for cases in which features clash.[9] In embedded clauses tense may be oriented to SpT or to the RT of the main clause; adverbials may specify a SitT that is not included in RT.

This discussion deals only with simple sentences. I do not include embedded clauses, or the contribution of syntactic structure to temporal location; see Smith

1978, Kamp & Rohrer 1989. Further, a complete account would recognize that there are some significant differences in the way times are calculated in discourse. They are beyond the scope of this discussion (Smith 1995; in preparation).

7.3.3 Other Viewpoints in Discourse Representation Structures

I now present a DRS for the progressive, an imperfective viewpoint. The imperfective viewpoint is specified at the interval in terms of the visible stretch of [e]. The characteristic feature of the imperfective is that the interval is open and includes neither endpoint of the situation. Imperfectives may present preliminary stages, internal stages, or resultant stages of a situation. The English progressive focuses internal stages: the visible portion of the event occurs at times [t] in [I] between the endpoints of [e]. I assume that the conceptual property of dynamism is associated with the imperfective viewpoint in English.

The situation type of the sentence (7a) is Accomplishment. Since the imperfective excludes the endpoints of a situation, the telic property is intensional in sentences with this viewpoint.

(7) a. Mary was walking to school.

b. Preliminary DRS

e x y
e = [Mary walk to school] walk (x,y) e ∈ {Accomplishment} x = Mary y = to school

Adding viewpoint information, the full aspectual DRS includes the imperfective viewpoint. It is located at the interval [I] and includes times after the initial endpoint of [e] and before the final endpoint of [e].

(8) Aspectual DRS for *Mary was walking to school*

I e x y $t_{i,j}$
1. e = [Mary walk to school] walk (x,y) 2. e ∈ {Accomplishment} 3. {Viewpoint (I,e) = Imperfective} 4. $t_{i,j} \in I$ 5. $t \in I \rightarrow t > I(e), t < F(e)$ 6. x = Mary 7. y = to school

The stretch of [e] that is visible comprises internal stages of the event [e], as represented on line 4 of the DRS. Because it is associated with [e], this stretch includes the conceptual properties of the event.

Finally, we add temporal information to the DRS. The full DRS has three temporal entities and conditions associated with them. The interval [I] is located at $[t_3]$, SitT (line 6); lines 7 and 8 specify that $[t_3] = [t_2]$ (SitT=RT), $[t_2] < [t_1]$ (RT < SpT). The default interpretation of $[t_1]$ is SpT, so this means that RT precedes SpT. This is precisely the temporal information given in the sentence.

(9) Temporal and aspectual DRS for *Mary was walking to school*

t_1 t_2 t_3 I e x y $t_{i,j}$
1. e = [Mary walk to school] walk (x,y) 2. e ∈ {Accomplishment} 3. {Viewpoint (I,e) = Imperfective} 4. $t_{i,j} \in I$ 5. $t \in I \rightarrow t > I(e), t < F(e)$ 6. I at t_3 7. $t_3 = t_2$ 8. $t_2 < t_1$ 9. x = Mary 10. y = to school

The Neutral viewpoint: This viewpoint makes visible the initial endpoint and at least one internal stage of a situation. English has no sentences with the Neutral viewpoint because perfective and imperfective viewpoints are available systematically. Consider then a sentence of French in the *Futur* tense, which has the Neutral viewpoint.

(10) Il jouera un robre de bridge.
He play^{Fut} a rubber of bridge

The aspectual DRS for this sentence is presented in (11). The situation type is Accomplishment, as in the previous example, allowing a clear comparison between viewpoints.

The neutral viewpoint makes visible the initial endpoint and at least one internal stage of a situation. Thus the DRS has elements in common with each of those above. The viewpoint includes the initial endpoint ($I(e)$), identified at $[t_i]$ in the interval [I], line 5. The neutral viewpoint also includes an internal stage of [e], identified in line 6. The DRS specifies that $[t_j]$ is in [e] and that it is distinct from both endpoints.

(11) Temporal and aspectual DRS for *Il jouera un robre de bridge*

$t_1\ t_2\ t_3$ I e x y $t_{i,j}$
1. e = [Il jouer un robre de bridge] jouer (x,y)
2. e ∈ {Accomplishment}
3. Viewpoint (I,e) = Neutral}
4. $t_{i,j} \in$ I
5. $t_i = I$ (e)
6. t∈ I → t > I (e), t ≠ F (e)
7. I at t_3
8. $t_3 = t_2$
9. $t_2 > t_1$
7. x: Il
8. y: un robre de bridge

DRSs with additional situation types and viewpoints are presented in the last section of this Chapter.

7.4 Relating the Discourse Representation Structure to a Model

DR theory provides for the truth-conditional interpretation of DR structures within a model. Truth conditions are assigned to discourses by an embedding theory that interprets the conceptual representations. Thus a sentence S is true if there is an embedding function that interprets S. The model contains a domain of individuals of various kinds, and indices for evaluation at given times, places and perhaps worlds. Properties of situations in the model will correspond to what is visible in the DRS. Suppose the DRS has a situation entity associated with the Accomplishment constellation [Mary walk to school]. The viewpoint is perfective so the situation is visible in its entirety. The embedding procedure will seek an event unfolding at the appropriate interval with the properties specified, that is, a durative walking event that involves the individuals *Mary* and *school* in a telic relation. Thus it will look for an initial point at which Mary begins walking, and a final point at which Mary is at school.

The conceptual characterization of [e] directly affects the truth-conditional interpretation of the DRS. Suppose that [e] is [John walk], an Activity with the properties [Atelic] and [Durative]. [Atelic] indicates that an event has initial and final endpoints, the latter arbitrary. These properties direct the truth-conditional mapping of the event in the DRS. They license an initial endpoint and arbitrary final endpoint at the interval specified. At time [t_i] we find the initial endpoint of the event [Mary laugh]. At the time(s) [t] we find the event [Mary laugh] in progress: [t] constitutes neither the initial nor final endpoint of the event. At time [t_j] the arbitrary final endpoint occurs. The characterization of the event as a whole involves properties which are intensional at particular times of the event, as noted above. At the initial endpoint or an internal stage t the event is atelic only intensionally. So at [t_i] the event that has begun is the sort that has internal stages and an atelic final endpoint, and so on for [t_{i+1}] and the other internal stages.

I do not propose here a truth-conditional realization of the conceptual properties of the stretch of [e]. Intension is a still-unsolved problem which arises for this approach and others as well. The problem is to finding a truth-conditional mapping of intensional properties. For situation type properties, we need a way of modeling how stretches of a situation are categorized as belonging to a situation of a given type. The problem has been discussed mainly for sentences with the imperfective viewpoint, but it holds quite generally.

Not all of the conceptual properties ascribed to a situation entity have truth-conditional force. For instance, marked aspectual choice frequently involves a shift in the property of dynamism. We must make sure that the appropriate properties are used to identify an appropriate event in a model. For instance, consider a familiar example representing a marked choice of dynamism in situation type:

(12) We're loving this walk

Since only non-statives appear with the imperfective viewpoint, the situation would be characterized by compositional rules as an Activity. The DRS for the sentence would therefore contain a situation entity [e] associated with [Mary love this walk], which would be characterized with Activity temporal properties. Yet the appropriate situation in the model is a State. The features of the marked situation type do not have truth-conditional force, whereas the features of the basic-level categorization do have it. Therefore we must provide for an embedding procedure that seeks to identify situations of a verb constellation in their basic-level categorization.

Temporal location is mapped by using the DRS entity [n], *now* (= Speech Time), as a coordinate. Speech Time is located in the model, and the additional specifications concerning temporal location follow automatically. If the time is prior to Speech Time, so is the time in the model. And if a sentence says *in an hour, for a week*, durations corresponding to such intervals will be sought in the model.

The model contains < S, U, tau, T,> where S is a set of situations, U a set of individuals, tau is a function from members of S to subsets of T. In mapping from a DRS to the model, the procedure searches for an event in S that corresponds to the event entity in the DRS, and a set of instants that correspond to time as specified in the DRS. The mapping consists of embedding functions, as follows:

(13) Embedding functions
- a. f:{Situation DR} → S (from situation types in the DRS to situations in the model)
- b. f:{Temporal DR} → T (from instants in the DRS to instants in the model)
- c. f:{Interval DR} → subsets of T (from intervals in the DRS to subsets of T in the model)

The initial and final endpoints of events are specified as follows:

(14) Endpoint specifications

a. Initial endpoint: (f(e)) = t iff t ∈ tau (f(e)) and ∀ t' ∈ tau (f), t' ≥ t.

b. Final endpoint: (f(e)) = t iff t ∈ tau (f(e)) and ∀ t' ∈ tau (f), t' ≤ t.

In this specification the endpoints of an event are recognizable because there are instants of times that precede and follow them. This amounts to a version of the perfective viewpoint that corresponds to an external perspective, as in the *Passé Simple*. In other tenses, such as the *Passé Composé*, and other languages, the perfective would require a slightly different characterization. For a more detailed discussion of the embedding function in Discourse Representation Theory, see the references of footnote 2.

7.5 Aspectual Indeterminacy and Inference

Inference plays an important role in the determination of aspectual meaning, as we have seen. Indeterminacy of situation type is resolved with the use of inference, and default inferences augment the information given explicitly in sentences with open presentations. In this section I present DRSs that include aspectual information which is due to inference. For such information, we need a stage of interpretation which is distinct from the level of semantic meaning licensed solely by linguistic forms. To account for these and other inferences that are essential in mental models, I suggest a multi-stage development of the DRS. The first stage constructs the basic aspectual value of a sentence. At later stages, pragmatic and contextual factors are drawn on to determine derived aspectual interpretations.

What is required is a search of the sentence and the wider context after the initial, basic-level determination of aspectual meaning. The search would seek information relevant to situation type, first directly in the context and then in other information available to the receiver. Certain objects of the search can be identified clearly, others are more problematic. Relevant information is not always easily accessible to compositional rules, since it appears in non-temporal forms. Frequency, for instance, may be expressed with phrases such as *the same thing* in *Bill swam in the morning and Jane did the same thing in the afternoon*. Pragmatic knowledge about the typical interval required for a situation is also relevant, as examples above have shown. But this is just the beginning. The form and range of a search of the context is a topic for further research.

The information gathered must also be evaluated by an explicit reasoning procedure. We have distinguished inferences based on explicit information, knowledge-based inferences and convention-based inferences (conventions of use, particular to a given language). Default inferences which augment information given must also be considered.

The analysis of aspectual meaning is thus developed in several stages. It begins with the basic-level aspectual meaning of a sentence and then deals with additional information developed through inference. Implemented in Discourse Representation Theory, the procedure will begin with a basic-level DRS and develop an interpreted-level DRS. The interpretation has essentially the form of a derivation in the DRS

itself. At the final stages of derivation an interpreted level of the DRS is constructed. New aspectual information, if any, is encoded at this level. Unfortunately, I cannot do more than sketch the stages and types of inference that are required to deal with aspectual indeterminacy. They require not only evaluation of information and use of conventions, but also integration with other parts of a discourse. I can suggest the result of the process, an interpreted DRS.[10]

The revised aspectual features will be stated in a second-level, interpreted structure. In the case of shifts from one situation type to another, such as that involving a frequency adverbial, the shifted situation type is given at the interpreted level. By using a derivational approach we provide that the basic-level situation type of the sentence is also available, at the first-level DRS. This is desirable because additional information might lead to reanalysis; all cases can be treated in the same way. An interpreted DRS will contain a shifted situation type, perhaps including an adverbial; and augmented information.

Consider first the basic and interpreted-level DRSs for a sentence with a shifted situation type, the ingressive reading of the sentence *Mary walked down the beach*. The basic-level categorization is an Activity. Both basic-level and derived categorization are noted in the interpreted-level DRS, by the compositional rules of the previous chapter. Temporal location is unaffected by the reinterpretation.

(15) a. Mary walked down the beach

b. Basic-level DRS

$t_1\ t_2\ t_3$ I e x y $t_i\ t_j$
1. e = [Mary walk down the beach]
2. e ∈ {Activity}
3. {Viewpoint $\{I_{I,F}$ (e) = Perfective}
4. $t_{i,j} \in$ I
5. $t_i = I$ (e), $t_j = F$ (e)
6. t ∈ I → t ≥ t_i, t ≤ t_j
7. I at t_3
8. $t_2 < t_1$
9. $t_2 = t_3$
10. x = Mary
11. y = the beach

(16) Interpreted-level DRS: ingressive
Mary walked down the beach (Achievement)

$t_1\ t_2\ t_3$ I e x y t_i
1. e = [Mary walk down the beach] walk (x,y)
2. e ∈ {Achievement (Activity)}
3. {Viewpoint I_I (e) = Perfective}
4. $\{t_i\}$= I
5. $t_i = I(e)$
6. I at t_3
7. $t_2 < t_1$
8. $t_2 = t_3$
9. x = Mary
10. y = the beach

The DRS correctly provides for an instantaneous event consisting only of an initial point; the complex intensional property indicates that the situation type is shifted.

Another type of interpreted-level DRS represents derived habitual Stative sentences. As we have seen, all verb constellations are habitual Statives in the context of a frequency adverbial. Formally, the verb constellation is in the scope of the frequency adverbial. The structure is represented in a complex DRS that has a subordinate DRS; Stative properties are given at the level of the subordinate DRS. (16) presents an interpreted DRS for *Mary walked down the beach every day,* a habitual action Stative. The viewpoint is perfective; recall that the English perfective does not make visible the endpoints of states.

(17) Interpreted-level DRS:

Mary walked down the beach every day (Stative)

$t_1\ t_2\ t_3$ I e x y z $t_{i,j}$
1. e = [Mary walk down the beach] walk (x, y)
2. e ∈ {State (Activity)}
3. {Viewpoint (I, e) = Perfective}
4. $t_{i,j} \in$ I
5. $t_i = I(e)$, $t_j = F(e)$
6. $t \in I \rightarrow t \geq t_i, t \leq t_j$
7. day (z) →

e', I'
i e'=[Mary walk down the beach]
ii e = Activity
iii {Viewpoint (I', e') = Perfective}
iv $t_{i,j} \in$ I'
v $t_i = I(e'), t_j = F(e')$
vi $t \in I \rightarrow t \geq t_i, t \leq t_j$

8. I at t_3
9. $t_2 < t_1$
10. $t_2 = t_3$
11. x = Mary
12. y = the beach

The complex stative entity [e] has the properties characteristic of statives. Its internal structure has the frequency adverbial with DRS that is dependent on it.

A full account of aspectual meaning should provide for default and conventional inferences about situations. Information based on inference may augment the information conveyed directly in a sentence. Default inferences fill in information about situations presented with an imperfective or neutral viewpoint. Such situations are partially visible. It is natural in many circumstances to infer that other properties of the situation have taken place. Inferences about initial endpoints of a situation in progress are almost always appropriate. For instance, the receiver of (18) may infer that the initial endpoint of the situation occurred.

(18) Jill was walking to school.

Since the situation is in progress, it is reasonable to infer the initial endpoint. Another default inference allows the receiver to assume the internal stages of a durative situation when it is presented perfectively.

It is often reasonable to infer the final point of a situation presented imperfectively. This is not a matter of default but of inference based on pragmatic and contextual information, and conventions of use. For instance, if (18) were followed by a sentence about what Jill did when she got to school, I would be justified in inferring that the final point of the event [Jill walk to school] had occurred. Again, if I know that Tolstoy wrote *War and Peace* and am confronted with the sentence, *Tolstoy was writing War and Peace*, I may well supply final the endpoint in my mental model.

Augmentation is more likely with imperfective and neutral viewpoints than with perfectives, because the former present open situations while the latter generally present closed situations. The Russian convention known as Statement of Fact makes crucial use of augmentation. By this convention the receiver of an imperfective sentence may infer that the endpoints of the event occurred. The inference is licensed by convention although the sentence does not make linguistic reference to endpoints. The conventions are, in a sense, instructions as to what to make of the information in a sentence: they guide inference. See the discussion of conventions of use in Chapter 4. Of course such an inference may be cancelled by other material in a text.

The interpreted-level DRS can allow naturally for augmentation. Since augmentation can be cancelled, information that is added on this basis is flagged with curly brackets. I give below an interpreted DRS for the imperfective *Mary was walking to school*. Assume that the sentence is followed by a sentence about what Mary did at school. The initial endpoint of the situation is inferable by default. Although the final endpoint is not visible, it is inferable conversationally through information in the context. The DRS for this sentence can therefore be augmented at the interpreted level by both initial and final endpoints.

The endpoints of the event, I(e) and F(e), are added to the list of properties of the entity [e]. The interval [I] of the DRS does not contain the endpoints in the interpreted-level DRS. The interval of the event made visible by the imperfective viewpoint does not, by definition, contain endpoints. Brackets indicate the information based on conversational inference: in this DRS both endpoints are bracketed.

(19) interpreted-level augmented DRS for *Mary was walking to school*

$t_1\ t_2\ t_3\ e\ x\ y\ I\ t_{i,j}$
1. e = [Mary walk to school] walk (x,y)
2. e ∈ {Accomplishment }
3. {Viewpoint $I_{i...m}$ (e) = Imperfective}
4. {I (e)}
5. {F (e)}
6. t ∈ I
7. t ∈ I → t > I (e), t < I (e)
8. I at t_3
9. $t_2 < t_1$
10. $t_2 = t_3$
11. x = Mary
12. y = to school

The augmentation of an initial endpoint (line 4) is licensed by general world knowledge. The augmentation of a final endpoint (line 5) is an inference, presumably based on additional knowledge. These inferences are typically made for sentences with the imperfective viewpoint.

Another type of augmentation is illustrated in (20). This is the inference that the final state of an Accomplishment or Achievement continues. The continuing state is the apron staying on; the notation (R) on line 8 indicates the result state of the accomplishment.

(20) interpreted-level augmented DRS for *She put on her apron*

$t_1\ t_2\ t_3\ e\ x\ y\ I\ t_{i,j}\ \{t_{j+1}\}$
1. e = [She put on her apron] put on (x,y)
2. e ∈ Accomplishment
3. {Viewpoint (I, e) = Perfective
4. $t_{i,j}$ ∈ I
5. $t_i = I$(e), tj = F(e)
6. t ∈ I → t ≥ t_i, t ≤ t_j
7. t_{j+1} ∈ I
8. R at t_{j+1}
9. I at t_3
10. $t_2 < t_1$
11. $t_2 = t_3$
12. x = she
13. y = her apron

The notion of an interpreted level is also needed for other interpretations of texts that involve contingent factors. Judgments concerning anaphora, for instance, are stated at the interpreted-level of the DRS (Asher 1993). The derivational approach provides naturally for the interpretation of both individual sentences and texts. In texts there are cases where receivers change the interpretation of a given sentence when they encounter other information later in the text. Such changes may involve backtracking. Backtracking would be relatively easy if the steps of interpretation are available as part of the derivation of the DRS. Moreover, there may be rhetorical reasons for recovering the basic aspectual value of a sentence.

Summarizing, the procedure for interpreting aspectual meaning begins with the basic-level interpretation of a sentence, and searches for others. The search depends on information in the context and inference of various types. If information or convention suggests a shifted interpretation, the aspectual meaning of the sentence will be shifted accordingly. If augmentation of the interpreted DRS is warranted, the additional material will be added. In this chapter DRSs have been presented for English sentences of all four situation types and perfective and imperfective viewpoints.

7.6 Additional DRSs

In this section I present some additional DRSs for other situation types, and of sentences from languages other than English.

I begin with DRSs for Stative and Achievement sentences in English, and then present DRSs for Statives in French, Chinese, Russian, and Navajo. The viewpoint presentation of Statives varies considerably among languages, and thus provides an excellent way of exhibiting the power of the analysis and its appropriateness for DR theory. In English the value of the perfective viewpoint varies with situation type. The French perfective includes the endpoints of all situation types. In Chinese Statives must have the neutral viewpoint.

The following DRSs represent the aspectual interpretation of sentences with Achievement and Stative situation types, both in the perfective. For simplicity I ignore temporal location; the interval [I] is located at [t_3], SitT. The Achievement DRS provides for a situation of a single instant.

(21) a. Allan won the race (Achievement)

b. DRS

t_i t_2 t_3 I e x y t_i
1. e = [Allan win the race] win (x,y)
2. e ∈ {Achievement}
3. {Viewpoint I (e) = Perfective}
4. I = {t_i}
5. t_i = (e)
6. I at t_3
7. $t_2 < t_1$
8. $t_2 = t_3$
9. x = Allan
10. y =the race

The stative require the perfective viewpoint in English. The perfective makes visible the temporal scheme, which does not include changes into or out of the state. In the DRS I represent such changes as neither endpoints of [e]. Thus the formal characterization of the actual sentence is very like an imperfective, although the stative and imperfective are quite different in the aspectual system of the language.

(22) a. Susan owns the farm (Stative)

b. DRS

t_1 t_2 t_3 I e x y $t_{i,j}$
1. e = [Susan owns the farm] own (x,y)
2. e ∈ Stative
3. {Viewpoint (I, e) = Perfective}
4. $t_{i,j} \in$ I
5. $t \in I \rightarrow t > I$ (e), $t < F$ (e)
6. I at t_3
7. $t_2 = t_1$
8. $t_2 = t_3$
9. x = Susan
10. y = the farm

The DRS ensures that neither the initial nor final endpoint of [e] lies within the interval presented by the sentence, interval [I]. The Russian stative is similar, except that the viewpoint is characterized as Imperfective, triggering appropriate conventions and inferences.

The precise specification of intervals in terms of endpoint properties permits us to capture the subtle distinctions that distinguish perfectives of different languages. In

French the perfective includes the initial and final endpoints of all situation types, including states. (23) illustrates with the DRS of a French stative sentence in the *Passé Composé*, a perfective viewpoint past tense.

(23) a. Algernon a aimé Marie.
(Algernon loved^{PC} Marie)

b. DRS

$t_1\ t_2\ t_3$ I e x y $t_{i,j}$
1. e = [Algernon a aimé Marie]: aimer (x, y)
2. e ∈ {Stative}
3. {Viewpoint (I, e) Perfective}
4. $t_{i,j} \in I$
5. $t_i = I(e)$, $t_j = F(e)$
6. $t \in I \rightarrow t \geq t_i, t \leq t_j$
7. I at t_3
8. $t_2 < t_1$
9. $t_2 = t_3$
10. x = Algernon
11. y = Mary

Another contrast is provided by stative sentences of both Chinese and Navajo, which require the neutral viewpoint. Neither perfective nor imperfective viewpoints are available for the presentation of states in Chinese. The neutral viewpoint makes visible the initial point and at least one internal stage of a situation. The Chinese example illustrates; the analysis of this sentence also holds for a Navajo sentence.

(24) a. Zhangsan ai Mali.
Zhangsan love^{Neut} Mali

b. Aspectual DRS[11]

I e x y $t_{i,j}$
1. e = [Zhangsan ai Mali]: ai (x, y)
2. e ∈ {State}
3. {Viewpoint (I, e) Neutral}
4. $t_{i,j} \in I$
5. $t \in I \rightarrow t > t_i, t < t_j$
6. x = Zhangsan
7. y = Mali

The imperfective may focus on preliminary stages of Achievements in English, French, Russian. (24) illustrates for an English sentence. The interval [I] is distinguished as preliminary by the specification that its times precede the event. The interpretation of the event as consisting of a single instant is allowed for by the condition that [e] is instantaneous.

(25) a. Mary was reaching the top.

DRS for *Mary was reaching the top* : Achievement

$t_1\ t_2\ t_3$ I e x y t_i
1. e = [Mary reach the top]: reach, x, y
2. e ∈ {Achievement}
3. {Viewpoint (I,e) = Imperfective}
4. t ∈ I
5. $t \in I \rightarrow t_i < I(e)$
6. I at t_3
7. $t_2 < t_1$
8. $t_2 = t_3$
9. x = Mary
10. y = the top

The resultant imperfective focuses an interval that follows the final point of a telic event. This type of imperfective is common in Chinese; it occurs in English with verbs of position and posture. The interval [I] is distinguished as resultant by the requirement that the times included in [I] follow the final endpoint of the event.

(25) a. Tianli zhongzhe huar
(Flowers are planted in the ground): Resultant

b. Aspectual DRS f

I e x y $t_{i,j}$
1. e = [Tianli zhong huar]: plant, x, y
2. e ∈ {Accomplishment}
3. {Viewpoint (I,e) = Imperfective}
4. t ∈ I
5. $t \in I \rightarrow t_i > IF(e)$.
6. x = Tianli
7. y = zhong huar

Sentences with marked aspectual choices are treated very naturally in the two stages

of DR theory. In such sentences a situation is categorized in a non-standard way, or a viewpoint is chosen when the standard conditions for its use are not met. The marked choice is represented in the DRS for a sentence, correctly giving the presentation of the text. However when the DRS is mapped onto a model the marked situation will be mapped onto a standard one. At the second, truth-conditional, stage of DR theory situations have their standard categorization. Criteria for the mapping are the space and time coordinates for an event and the verb constellation that indicates what event is involved. The difference between standard and non-standard aspectual choice comes out in relating the DRS to a model.

Notes

[1] I would like to thank Nicholas Asher and Hans Kamp for comments on this material; I also thank the Semantics Group of the Center for Cognitive Science at the University of Texas for useful feedback and discussion.

[2] Discourse Representation Theory was developed more or less simultaneously by Hans Kamp and Irene Heim. In Heim's work it is known as File Card Semantics. The basic references for the theory are Heim 1982, 1983a, 1983b and Kamp, 1979, 1981a, 1981b, 1985. See also Kamp & Rohrer 1989, Kamp & Frey 1990, Kamp & Reyle 1993. Recent papers using DR theory include Asher 1986, Covington & Schmitz 1987, Frey 1985, Klein 1986, Guenthner 1986, Reyle 1985, Roberts 1986, Rooth 1986, Sells 1987.

[3] Kamp's notion of a mental model includes the concepts conveyed by a sentence as well as truth-conditional information about the structure of a situation. The mental models approach is not monolithic: not all agree. According to the psychologist Johnson-Laird, discourse models "make explicit the structure not of sentences but of situations as we perceive or imagine them" (1989:471). Johnson-Laird presents a useful discussion of mental models, tracing the approach to the prescient work of Craik 1943. See also Garnham 1987, 1989. For a general introduction to cognitive science see Posner 1989.

[4] Results from psycholinguistic experiments strongly support the mental models approach. They show that people rely on inferences of a kind that crucially involves models of situations. For discussion of inferences as central feature of comprehension see Clark 1977, Bransford et al 1972. Work on anaphora has been particularly telling, cf Stenning 1978, 1986; Garnham & Oakhill 1989. Similar arguments set in a computer science context are presented in Webber 1981.

[5] The notion of possible worlds allows the modeling of conditions under which a sentence that is true or false in this world might be true in another world; for an introductory discussion see Dowty, Wall & Peters 1981:124-5.

[6] For a lucid discussion of the role of conceptual features in language and in the representations of the theory, see the discussion of the *Passé Simple* and the *Imparfait* in Kamp & Rohrer 1989, chapter 3.

[7] Following Kamp & Rohrer, I will assume a set of instants in the model; intervals are constructed from the set of instants. In traditional tense logic statements are evaluated at points of time. In recent work, however, intervals have been proposed as basic for evaluation (Bennett & Partee 1978, Dowty 1979). The connection between the point-approach and the period-approach is discussed in van Benthem 1980.

[8] In this treatment tense and adverbials trigger features of temporal location only. Kamp & Rohrer, dealing with French, assign features of both temporal location and aspectual viewpoint to tenses.

[9] Such sentences, e.g. *John was leaving in 3 days*, do not establish RT; they are discussed in Chapter 5.

[10] In recent work, Asher has also proposed another level of DR theory structure; see Asher 1993, 1996.

[11] I do not include temporal location information for the Chinese sentences. Other calculations are necessary than those given above, since Chinese does not have tense.

PART TWO

INTRODUCTION TO PART TWO

The following chapters analyze the aspectual systems of five languages. I will assume familiarity with the ideas and techniques already presented, and will simply refer to discussions and examples in Part I rather than repeating them.

The discussion emphasizes features that are interesting and/or problematic for each language. The main feature of the French system is the way aspect interacts with tense, and so that topic is given considerable discussion. For Russian, the main topic is the way that meanings and conventions are associated with the viewpoints. The dual aspectual function of verb prefixes, and viewpoint in negation and infinitives, are also discussed. The viability of the general approach is paramount in Mandarin Chinese and Navajo, since they have not been analyzed in this manner before. The rich viewpoint choices of Mandarin are noteworthy; for Navajo, I discuss the constraints on viewpoints and the unusual lexicalization and morphology of situation types. For English the Perfect construction and the Futurate are discussed in some detail; English examples are given throughout Part I.

Viewpoint is given more attention than situation type in most chapters, because there are generally more differences among languages in this component. Pragmatic conventions of use as well as semantic meanings are given for each language. To support the analysis I present temporal schemata and formal statements of the viewpoints. This facilitates comparison as well as understanding of the individual languages. I have not attempted to state detailed rules, partly because I am dealing with subsystems that interact with the rest of the language. The syntactic properties associated with temporal features are laid out for languages other than English. Sentences in these languages have been checked with native speakers.

The chapters on each language contain the following sections:

- Introductory comments on what is noteworthy in the aspectual system of the language.
- Viewpoints: which ones appear, with what values, how signalled.
- Conventions of use for the viewpoints.
- Relation of aspect to temporal location.

- Syntactic correlates of aspectual temporal properties.
- Situation types: how expressed, how tested.

There are many topics relevant to aspectual systems that I have not been able to consider here. They include subjunctives, conditionals, modality, negation, quantification and the structure of nounphrases, adverbials, and full accounts of temporal location systems.

CHAPTER 8

THE ASPECTUAL SYSTEM OF ENGLISH

8.1 Introductory Characterization

English offers a consistent, obligatory choice of viewpoints in all tenses. The perfective viewpoint is available for all situation types and is therefore the dominant viewpoint in the language. The value of the perfective varies with situation type. The perfective presents events as closed and states as open, accordanted with each. The progressive is the main imperfective viewpoint; it is available neutrally only for non-stative sentences. There is also a limited resultative imperfective, which appears with verb constellations of the position and location classes.[1]

The five major situation types are covert categories in English; the distinction between statives and non-statives is strongly grammaticized. Super-lexical morphemes and most other morphemes that shift situation type are independent rather than affixal; certain derivational affixes also affect the situation type of a sentence. There is a marked set of situation types that appears with the Futurate.

Temporal location is conveyed by inflectional past and present tenses, and periphrastic tenses. Future time is conveyed by the modal *will* and by future adverbials with the present tense, the Futurate. There is a Perfect construction which allows both perfective and imperfective viewpoints and appears with all tenses.

8.2 Viewpoint Aspect

The choice of viewpoint is syntactically obligatory for all clauses, so that the system is symmetrical from the syntactic point of view. However the symmetry is not complete at the semantic level. General constraints on the aspectual interpretation of Present sentences have the effect requiring an open presentation (Chapter 5).

Viewpoint is indicated by the presence or absence of the verbal auxiliary. The perfective viewpoint is phonetically zero, contrasting with the auxiliary morpheme which conveys the imperfective, progressive viewpoint. (1) illustrates; for consistency, all examples in this chapter are given in the past tense.

(1) a. Mary talked. (perfective)
b. Mary was talking. (imperfective: progressive)

This analysis of English is based on distribution: there is a consistent, obligatory contrast between the auxiliary *be+ing* and the simple verb form, with a zero morpheme. Since all verbs have one of these forms, all verbs in English have a viewpoint morpheme. This is the basis for the claim that the English system has perfective and imperfective, but not the neutral, viewpoint. The neutral viewpoint arises as a default when a sentence has no viewpoint morpheme.[2]

8.2.1 The Perfective Viewpoint

The perfective viewpoint appears with sentences of all situation types. For English this viewpoint has a consistent yet variable meaning: the perfective presents in its entirety the temporal schema associated with each situation type. Non-statives are closed in the perfective. Statives are open because their temporal schema does not include changes into and out of a state. The English perfective is learnable from positive evidence, as is necessary when parametric variation is posited.

Non-stative perfectives present events as closed. The interpretation of non-statives is demonstrated in some detail for English in Chapter 3; I repeat the examples here:

(2) a. Lily swam in the pond. (Activity)
b. Mrs Ramsey wrote a letter. (Accomplishment)
c. Lily knocked at the door. (Semelfactive)
d. Mr Ramsey reached the lighthouse. (Achievement)

The events are taken as terminated or completed depending on the situation type of the sentence.[3]

In contrast, stative sentences with the perfective viewpoint—the only viewpoint neutrally available to such sentences—are flexible in interpretation. Consider the examples:

(3) a. Sam owned three peach orchards.
b. Mary lived in New Orleans.
c. Bill was angry.

On one reading, these sentences convey an open interpretation. The state has not ended, but continues into the present. There is also the possibility that a state has ended, a closed interpretation. Both readings are available for stative sentences. (3a), for instance, can be felicitously conjoined with an assertion that the state continues and that it no longer obtains, as (4) illustrates.

(4) a. Sam owned 3 peach orchards last year, and he still owns them.
b. Sam owned 3 peach orchards last year, but he no longer owns them.

Both conjunctions are good, showing that that the perfective viewpoint of a state does not include its final endpoint. If it did the continuing interpretation would be impossible. Thus the closed interpretation is not semantically required by the perfective viewpoint, and must be due to pragmatic inference.

The information conveyed by a stative perfective is precisely that of the temporal schema of a state. The schema of a state does not include its endpoints, because the endpoints involve change of state. States merely consist of a single undifferentiated period. Stative sentences in the perfective viewpoint are therefore compatible with either a closed or open interpretation, depending on context.

The key to the analysis is that the English perfective viewpoint consistently interacts with situation type. The viewpoint spans the temporal schema of the situation it focuses. If the temporal schema includes endpoints, they are included in the perfective viewpoint of that event type. This simple statement accounts for the interpretation of perfective non-stative sentences as closed and for the open interpretation of Statives. (5) gives a succinct verbal statement.

(5) A sentence with the perfective viewpoint presents a sentence with the endpoint properties of its situation type schema.

This statement correctly provides for the different interpretations demonstrated above. The perfective viewpoint for Activities includes an arbitrary final endpoint. The perfective for Accomplishments includes a natural final endpoint; for Semelfactives and Achievements it focuses on the single-stage event; for Statives no endpoints are included. Thus the two-component approach to aspect allows a simple and general statement about the perfective viewpoint in English. The formal statement of this viewpoint is discussed in Chapter 6.

8.2.2 The Imperfective Viewpoint

Imperfective viewpoints focus on part of a situation; they give no information about its endpoints. The main English imperfective is a progressive, available neutrally only for non-stative events. It presents events from an internal perspective which is due to the temporal span of the viewpoint. Progressives are typically durative and have connotations of dynamism and volition. The progressive has a marked use in which sentences with Stative constellations appear in the progressive. The effect is the presentation of the state as an event. Sentences of this type are quite common, especially in the spoken language. There is also a resultative imperfective, discussed below.

In its basic use the English progressive focuses on the internal stages of durative, non-stative situations; the examples illustrate:

(6) a. * He is knowing the answer. (Stative)
b. Mary was walking in the park. (Activity)
c. Sam was eating an apple. (Accomplishment)

These sentences conform to the imperfective as stated in Universal Grammar because the viewpoint spans an internal interval.

Instantaneous events do not offer such an interval. However, the progressive can be used with many Achievement verb constellations. The viewpoint focuses the preliminary stages of the event with no information as to its outcome, as in (7).[4]

(7) a. Bright Star was winning the race.
b. Helen was reaching the top.
c. ?Mary was finding her watch.

Certain Achievements are odd with the progressive, as (7c) shows. The oddity is idiosyncratic, and is due to the nature of particular Achievements. It is difficult to think of certain events, such as finding, as having preliminary stages. This accounts for the dubious acceptability of the sentence.

Semelfactives do not accept the progressive. There is no Semelfactive interpretation for the examples of (8), for instance: they cannot be taken to refer to a single knock or a single cough.

(8) a. Jane was knocking at the door.
b. Allan was coughing.

These sentences are neither odd nor ungrammatical, of course. They are interpreted as derived Activities of the multiple action type. The progressive neutrally focuses internal stages of these events.

Progressives of Activities and Accomplishments do not have the preliminary interpretation in English. In principle durative events might involve preliminary stages, and we know that the progressive viewpoint focuses preliminaries in some cases. Yet this interpretation is not available for the progressive, as (9) shows:

(9) a. They were building a house.
b. He was cooking dinner.
c. She was walking in the park.
d. He was laughing.

These sentences can only mean that the events are in progress. But there is one construction of English which actually requires the preliminary focus of the progressive viewpoint, namely in the Futurate; see section 8.4.3 below.

Progressive sentences often have connotations that are directly related to their semantic meaning. Events are presented dynamic, temporary, and/or volitional, in progressive sentences, when lexical content and context make them appropriate. These connotations are brought out clearly by a comparison of sentences that differ only in viewpoint. The following pairs are well-known in the literature (Jespersen 1931, Curme 1935, Leech 1970, Smith 1984).

(10) a. They were living in Geneva.
b. They lived in Geneva.

(11) a. She was blinking her eyes.
b. She blinked her eyes.

(12) a. The ship was moving.
b. The ship moved.

There is a vivid quality to these sentences, and often a specific connotation. (10a) suggests that they lived only temporarily in Geneva, while (10b) has no such suggestion. (11a) suggests an exercise of will, or wilfulness; (11b) does not. And finally, (12a) suggests activity more vividly than (12b), though both sentences explicitly refer to motion. These connotations arise directly from the semantics of the viewpoint.

Since the progressive is limited to events, stereotypic features of events tend to be associated with it. Indeed these connotations are typical of progressives generally (Dahl 1985). Activity and volition are typical characteristic of dynamic events. Focusing on the internal, successive stages of an event can suggest dynamism and a temporary flavor. Since each stage is followed by another, and each stage brings the final endpoint closer, the stages are seen as temporary. These connotations depend on the particulars of a sentence. They do not always arise—one would not say that *The earth is revolving on its axis* has a temporary connotation—but they are available for progressives if the situation and context invite them. The connotations are therefore distinct from the semantic meaning of the progressive, which holds for all sentences with that viewpoint.

English has a resultative imperfective viewpoint which appears with verb constellations of position and location. Sentences with this viewpoint have the same form as progressives, as in (13):

(13) a. Your drink is sitting on the table.
b. The picture was hanging on the wall.
c. The statue was sitting on the corner.

In these sentences the viewpoint focuses an interval that follows a change of state into the position. The interval is not dynamic: it does not consist of successive stages. Lexically the verb constellations denote the event which brings about the resultant state. Sentences with this viewpoint are semantically stative, as syntactic tests show. For instance, the pseudo-cleft *do* requires a non-stative; the construction is ungrammatical with resultatives, as (14) shows:

(14) *What your drink was doing was sitting on the table.

Given the possibility of an internal or external focus, one can construct sentences that are ambiguous, allowing both the dynamic event and static resultative readings. (15) illustrates:

(15) John was sitting in the chair.

On the Accomplishment reading, the sentence presents John in the process of assum-

ing a seated position; on the Stative reading, he is already seated. The two readings are due to the fact that imperfective viewpoints may focus on internal or resultant intervals.

Resultative sentences like (15) may seem anomalous if they are considered as progressives. But in the context of a more general study of aspectual systems across languages, they are easily recognized as imperfective. In our framework resultatives are treated very naturally. They are imperfectives which focus an interval that follows a change of state (Chapter 4). (16) shows schematically how the progressive and resultative, both imperfectives, focus different intervals of a situation. I and F represent the initial and final endpoints of a situation, and the slashes indicate the possible span of the viewpoints.

(16) .....I.....F.....
//// //// /////
Prog Prog Result

The progressive may focus on either the preliminary external or the internal stages of a situation; the resultative imperfective focuses resultant external stages.

Marked aspectual choice: The progressive viewpoint also appears in sentences with stative constellations. Such sentences represent marked aspectual choice. Progressives with stative verb constellations have an emotional color that is lacking in neutral presentations of states. Kruisinga 1911 refers to progressive statives as descriptive, Poutsma 1926 characterizes them as vivid, Marchand 1955 mentions their immediate quality. Consider (17):

(17) a. John was really liking the play.
b. That cake is looking done.
c. Amy is resembling her great-uncle today.

These sentences present states as events, endowing them with the dynamism and other connotations of events. They suggest not only activity but also the temporary quality that is characteristic of an event. The suggestion is conveyed by the linguistic forms that appear in these sentences. Since the progressive is associated with non-stative events, sentences with that viewpoint are also associated with events.

Formal statements of the English imperfective viewpoints must allow for their interaction with particular situation types and their availability for non-standard aspectual choice. The viewpoint imposes the stage property, as indicated by the subscript. (I assume that the stage property is a reflex of the temporal feature of dynamism.) In the statement of (18), the notation F/E_t includes the final endpoint of a durative event, or the single stage of an Achievement. I assume that the situation type schema for the latter includes preliminary stages.

(18) The Progressive Viewpoint
a. The viewpoint presents an interval of an event that includes neither its initial nor final endpoint, and that precedes the final endpoint.

b. ..... F/E_t
$///+_{stage}$

Formulations such as this depart from the current practice by specifying that the dynamism property of the situation focused is maintained in the imperfective; see the discussion of statives and imperfectives in Chapter 4. The provision of the stage property allows for marked aspectual choice. I have suggested the metaphor of a camera lens for the way aspectual viewpoints present situations. Pursuing the metaphor, we can say that the lens filters situations in certain ways. In the case of marked use of the progressive, the viewpoint imposes the stage property characteristic of events.

A schema and statement for the English resultative imperfective is given in (19):

(19) The Resultative Imperfective
a. $I\ F_{Nat}$ ..... /////
b. The resultative viewpoint presents an interval of a positional or locative that follows the final endpoint of a change of state.

Location and positional verb constellations are discussed below.

8.2.3 Conventions of use

The pragmatic conventions of use in English depend on the pattern of the language and the semantic meanings of the viewpoints. The perfective viewpoint is the dominant viewpoint in English because it is available for all situation types. It is therefore the unmarked choice of viewpoint in many cases.

By convention, then, the perfective viewpoint is used when the situation warrants—unless other factors such as narrative pattern or mutual knowledge intervene. The progressive viewpoint appears when the semantic or pragmatic situation does not warrant the perfective. For instance, if Janet and Bill were building a house, and they didn't finish it, I must use the progressive to talk about the event. I also use the progressive if I don't know whether they finished it. Given these general conventions, when a speaker uses the progressive the receiver is entitled to assume either that the situation does not warrant the perfective, or that a special emphasis of some kind is being made.

The progressive viewpoint is conventionally chosen for emphasis or other rhetorical reasons, when mutual knowledge allows. It is used to emphasize that a situation is in progress at a particular time, often contrastively; and/or to invoke connotations of activity, vividness, impermanence, or incompleteness. These connotations are associated with the semantic focus of the English progressive viewpoint on a dynamic situation in progress. (20) illustrates:

(20) a. In March, Charles was building a stone wall.
b. We were visiting Istanbul.

English choices of this type are discussed in Chapter 4. As noted there the factor of mutual knowledge is crucial: if speaker and receiver have independent information

about a situation, the choice of viewpoint is more free than if they do not. For other examples see the discussion of marked aspectual choice and of situation types.

By the general conventions of narrative discourse, the progressive viewpoint often presents backgrounded situations. The convention holds for single sentences as well. For instance, in sentences with temporal clauses the progressive often presents an event as the background, or temporal frame for another (Chapter 4). The situation introduced by the temporal adverbial is in the foreground, as in (21):

(21) Mary was jumping into a taxi when John shouted to her.

In (21) the event [Mary jump into a taxi] is presented as durative, perhaps counter to standard intuitions about such events. The syntactic context, the *when*-clause, has the effect of backgrounding and extending the other event. Such contexts allow somewhat marked extensions of situations as background.

8.3 Situation Type

8.3.1 Temporal properties in sentences of English

Sentences of each situation type have syntactic and semantic properties that realize the features of their temporal schemata. This section summarizes the syntactic facts about the temporal properties of the situation types from the discussion in Chapters 2 and 3.

Dynamic/Static: The contrast distinguishes states and events. Events have the semantic property of dynamism. They take time, they involve energy and often agency. Dynamism is realized by forms and constructions associated with agency: subject agency adverbials, instrumentals, and imperatives. Other syntactic reflexes of dynamism are the pro-verb *do* in pseudo-cleft sentences and the progressive viewpoint. The set of properties associated with dynamism comprises 'dynamic syntax.' In present tense sentences with the perfective viewpoint, dynamic situations are interpreted as habitual statives. Stative sentences do not have the properties of dynamic syntax.

Completion/Duration: Completion/Duration is associated with telic situation types, and expressed by adverbials and main verbs. Adverbials with *in* (*in an hour*) indicate completion, as do the verbs *finish* and *take*. In contrast, simple durational verbs and adverbials are atelic: they are associated with atelic situations. The adverbials *for* (*for an hour*) and *from-to* (*from 2 to 3 in the afternoon*) indicate simple duration, as do the verbs *stop* and *spend* (*They spent an hour playing bridge*).

Durative/Instantaneous: Durative events are good with forms of simple duration; if they are telic, they also allow forms of completion. Completives have an ingressive interpretation with instantaneous telic events. Instantaneous events do not allow forms of simple duration.

Non-detachability: Durative telic events (Accomplishments) have a non-detachable relation between process and outcome. The relation can be demonstrated in English with perfective and progressive sentences. For non-detachable situations, the truth of a perfective sentence entails the truth of the corresponding progressive sentence. In addition, the adverb *almost* indicates the property of non-detachability. Sentences with *almost* are ambiguous: the adverbial may pertain to the beginning of the process or to the outcome.

I now discuss the realization of the situation types in English. I focus on independent clauses; the facts hold for infinitives as well. Nominals, participles and other constructions are beyond the scope of this discussion. Since the English facts are presented at some length in Part 1, these sections are summary in nature. I follow the general principle about intrinsic features stated Chapter 6: the intrinsic feature of a verb depends on its value in a minimal sentence. The numbered examples below either have not been previously discussed, or are particularly important for characterizing the situation type. Sentences given in the text exemplify points made in Part I of this book.

8.3.2 Activities

Activity sentences present atelic durative events, as (22) illustrates:

(22) a. Sam strolled in the park.
b. Mary pushed a cart.
c. The wheel revolved.
d. The children ate apples.

The essential semantic feature of this situation type is that the events are cumulative, or uncountable. Therefore the verb constellations of Activities tend to have nominals of mass nouns and bare plurals.

There is a characteristic entailment pattern for Activities, in which the open presentation of the situation allows the inference of a closed Activity. If an progressive Activity sentence is true for a given interval, the corresponding perfective sentence is also true; and vice versa. Therefore, if it is true that *Mary was walking from 3 to 4 pm* then it is also true that *Mary walked from 3 to 4 pm.*

Verb constellation patterns
a. Verbs with the [Atelic] feature form Activity constellations with NP or Locative complements, e.g. *John walked in the park, Mary walked the dog, Mary pushed the cart.*
b. Verbs with the [Telic] feature form Activity constellations with mass nouns and bare plurals (*He wrote books*). Since such NPs refer to uncountable things, events that involve them are indefinite in extent and have arbitrary final endpoints.
c. Particles: verbs with a particle such as *in, at, on* often appear with [Telic] verbs in Activity constellations. In this context the particles may have an atelic effect, as in (23):

(23) a. John wrote at the report.
b. Mary read in the book.
c. He chipped away at the boulder.

These are events that have no natural final endpoint, or that are not expected to attain that endpoint. The constellations with the verb alone are often Accomplishments, e.g. *John wrote the report.*

d. Multiple-event Activities consist of a series of events, usually of short duration; their internal stages are telic or Semelfactive events. Activities of this type represent a derived situation type; they are formed from basic-level verb constellations which refer to the events of the internal stages. They may have a temporal adverbial which indicates a number of successive events, as in (24a); or with an adverbial that pragmatically suggests the multiple-event interpretation. This happens when there is a real disparity between the interval required for a single event and the adverbial interval, as in (24b).

(24) a. The boy coughed many times.
b. I knocked at the door for an hour.
c. The wheel revolved for a long time.

e. Derived durative Activities have incompatible parts: an atelic durative adverbial and a telic verb constellation. The adverbial value overrides that of the verb constellation, giving such sentences an atelic reading, as in *He wrote a letter for an hour.* The event is interpreted as a process which is not associated with an outcome or natural endpoint.

Syntactic properties

a. Activities have dynamic syntax.
b. Activities are compatible with adverbials and verbs of simple duration: *for an hour, stop, spend.*
c. Activities are incompatible with completives: *in an hour, finish.*
d. Activities have a habitual reading in Present perfective sentences.

8.3.3 Accomplishments

Accomplishments are durative events with natural final endpoints:

(25) a. Zipporah walked to the lake.
b. Tom ate a sandwich.
c. Sylvia drew a picture.

Accomplishments result in a change of state, which may or may not endure. An essential property of Accomplishments is that they involve specific, countable events. Therefore at least one countable NP argument must appear in an Accomplishment verb constellation.

The characteristic entailment pattern of Accomplishments allows the inference of a process from an event, but not vice versa. If *Mary wrote an opera last summer is true*, we can infer that *Mary was writing an opera last summer* is true. But we cannot infer the complete event from a sentence informing us that it was in progress.

Accomplishments are ambiguous with the adverb *almost*:

(26) Mary almost repaired the tape recorder.

On one reading Mary almost began repairing; on the other reading the repairing was almost successfully completed.

Result complements appear in many Accomplishment constellations. Such complements give information about the final or resultant state of the event. Result states may be specified by adjectives, PPs, or NPs: *The meat burned to cinders.* Result complements also appear with Achievements.

Verb affixes may affect situation type, notably the inchoative suffixes *ø* and *-en.* These suffixes appear productively with nouns and adjectives, forming verbs with the intrinsic feature [Telic]: eg. *to broaden, to heighten, to whiten, to darken,* etc.; *to cool, to heat, to blue, to yellow,* etc. The resulting verbs are Accomplishments or Achievements, depending on whether there is a process seen as intrinsically related to the outcome.

The verbal prefix *re-* (to do over again) is telic: it appears in constellations with verbs such as *reopen, reevaluate, reassemble.* etc. Stative, Activity and Semelfactive verbs do not take this prefix: **rebelieve, *reunderstand, *resneeze, *relaugh, *reknock* are impossible, nor do verbs with *re-* appear in atelic constellations. The examples illustrate:

(27) a. John rethought the problem.
b. *John rethought that 2 + 2 = 5.
c. They redanced the second number.
d. *They redanced.

The prefix *re-* is productive: new telic verbs are good with this prefix. Among spies, for instance, there might be a verb *to microdot,* meaning to send a message by means of a microdot. One could easily say, in the event of a communication failure, *We re-microdotted the message.*

There are many other affixes with telic properties. *Pre-*, like *re-*, requires situation types with natural endpoints (*preboard* but not *presneeze,* for instance). Causative affixes, which form verbs from adjectives and nouns, are telic: *be-(becalm) en-(enslave), mal- (malfunction)* and *-ize (itemize), -ify, -ate.* Following Selkirk, I will assume that affixes are lexical items (1982: 59). Affixes with aspectual properties will be visible to the compositional rules that determine the aspectual value of a sentence.

Verb constellation patterns

a. Verbs with the intrinsic features [Telic], [Durative] form Accomplishment constellations with their arguments, e.g. *Mary built a sandcastle, John stood up.*
b. Verbs with the intrinsic features [Atelic] [Durative] form Accomplishment constellations with Directional PPs or with certain prepositions, e.g. *Mary ran to school, John ran out.*
c. Inchoative affixes produce verbs that are [Telic]. When the change of state involves a period of time the verb is of the Accomplishment type, e.g. *enfold, redden.*
d. Result complements with atelic intransitive verbs produce Accomplishment verb constellations. In some cases the result complement forms an Accomplishment from

an atelic verb constellation, as in the following examples. Without the complements the verbs *laugh* and *sing* are atelic.

(28) a. Mary laughed herself silly.
b. Mary sang Joel to sleep.
c. Mary sang Joel into a good mood.

In a surface structure analysis of the type outlined here, compositional rules will account for such cases without difficulty. In a more generatively oriented account they can be produced by a lexical rule, as argued by Carrier-Duncan and Randall 1986, from which these examples are taken; see also Levin and Rappaport-Hovav 1995.
e. Completive adverbials produce Accomplishments when they appear with Activity verb constellations. The adverbial has a [Telic] feature, which overrides the value of the verb constellation, e.g. *Susan swam laps in an hour.* Such sentences are reasonable so long as the event can be understood to have an implicit natural endpoint.
f. Durative adverbials may have internal scope with Accomplishment constellations. Such adverbials are the innermost of two, e.g. *Mary went to Paris for 3 days for 3 years,* cf the discussion of Chapter 5.

Syntactic properties
a. Accomplishments have dynamic syntax.
b. Accomplishments are incompatible with forms associated with simple duration: *for an hour, stop.*
c. Accomplishments are compatible with forms associated with completion: *in an hour, finish.*
d. Accomplishment sentences are ambiguous with *almost.*
e. Accomplishments have a habitual stative interpretation in Present perfective sentences.

8.3.4 Semelfactives

Semelfactive are single-stage atelic events. Verb constellations that refer to them must have a countable nominal argument.

(29) a. Sam coughed.
b. Della tapped on the desk.
c. The bird flapped its wing.

The progressive viewpoint is incompatible with Semelfactives. Sentences with a semelfactive verb constellation and this viewpoint are interpreted as multiple-event Activities. Thus a sentence like *Helen was knocking at the door* can only refer to an Activity whose stages consist of knocks: it cannot mean that Helen was engaged in the preliminary stages of giving a single knock. These are cases of a shift in situation type, triggered by the aspectual incompatibility of the adverbial and the verb constellation.

Semelfactives are also incompatible with direct expressions of duration. In the context of such duratives the verb constellations have a shifted interpretation: they are taken as multiple-event Activities:

(30) a. I stopped knocking.
b. I knocked for an hour.

Adverbials that imply duration such as *slowly* are marginally possible with Semelfactives on an ingressive interpretation: *I slowly coughed* may mean that I was slow to cough (although the sentence also has a multiple-event reading in which the coughs followed each other at a slow rate). The other features associated with dynamism and atelics are compatible with semelfactive Achievements, e.g. subject-oriented adverbials and the pro-verb *do*.

Verb constellation patterns
a. Verbs may be transitive or instransitive; they have the intrinsic properties [Atelic] and [Instantaneous]. There are no derived Semelfactives.

Syntactic properties
a. Semelfactives have dynamic syntax.
b. Semelfactives do not accept the imperfective viewpoint.
c. Semelfactives are incompatible with forms associated with duration or completion.
d. Semelfactives have the habitual stative interpretation in Present perfective sentences.

8.3.5 Achievements

Achievements are instantaneous changes of state, as in (31):

(31) a. Mary reached the top.
b. Tony shattered the glass.
c. The sick dog died.

They allow the progressive viewpoint, focusing preliminary, detachable stages of the event. For instance, *She was reaching the top* makes visible preliminary stages of the Achievement [She reach the top]. Such an interpretation shows that the situation type in English includes preliminary stages as well as an instantaneous change of state.

With most completive adverbials and verbs, Achievements have an ingressive interpretation. For instance, *We reached the top in three hours*, and *It took us three hours to reach the top*, have the reading that at the end of three hours the event occurred. However, the verb *finish* associates process and outcome and cannot appear with Achievements.

(32) a. #We finished reaching the top.
b. #Bright Star finished winning the race.

This verb provides a good test for verb constellations that are on the borderline between Accomplishments or Achievements.

Achievements are sometimes odd with agent-oriented adverbials, e.g. *John deliberately reached the top*. However in other sentences the adverbial is impeccable, for instance *John deliberately missed the target*. See Chapter 2 for discussion of such examples.

Verb constellation patterns

a. Basic Achievements are formed mainly from verbs with the intrinsic features [Telic] [Instantaneous]; derived inchoatives, however, may have durative telic or atelic verb constellations.
b. Achievement constellations have verbs that are intransitive or intransitive. Achievements include verbs of perception e.g. *I saw the star, I heard the music, I understood.* Perception verbs also occur in other situation types.
c. Inchoative affixes form verbs with the intrinsic features of Achievements when they refer to events with duration such as *awaken, enliven, hearten.*
d. Shifted Achievements with an inceptive interpretation occur with verb constellations that refer to states and Activities at the basic level of categorization, for instance *Mary was sick* (= Mary got sick) and Activities such as *Mary walked down the beach.* (= Mary started to walk down the beach).

Syntactic features

a. Achievements have dynamic syntax.
b. Achievements in the progressive focus preliminary stages.
c. Achievements are incompatible with forms of simple duration.
d. Achievements are compatible with forms of completion on an ingressive interpretation.
e. Achievements have a habitual stative interpretation in Present perfective sentences.

8.3.6 Statives

Statives in English appear in verbal and copular sentences:

(33) a. John loves Mary.
b. Terry thinks that the world is round.
c. The dog is in the yard.
d. Olivia is amusing.

The covert category of Stative is salient in English in a way that other situation types are not. There are both syntactic and morphological correlates of stativity. The former includes the progressive and pseudo-cleft *do*; the latter includes verb prefixes such *re*.

Verb constellation patterns

The typical syntactic patterns of statives are listed below.
a. Verbs with the intrinsic feature [Stative] may be intransitive (*exist*) or transitive (*love, know*), and allow sentential complements (*think that*). The copula *is* has the intrinsic feature [Stative]. Positional and locative verbs have both stative and atelic features; see section 5.
b. Prepositions affect the situation type of some intrinsically stative verbs. For instance *I think that Venus is close to Mars* is Stative, but *I am thinking of/about space travel* is an Activity.
c. There is a productive syntactic pattern for statives that are related to event constellations. The event verb and its complement appear in the form of a prepositional phrase with the copula:

(34) a. The bird is in flight.
b. The meeting is in progress.
c. I am in the midst of writing a report.
d. The murderer is in the act of escaping.

(34a) has a nominal form of the main verb. Such direct nominals are quite limited: one can also say *in motion, in construction,* but not for instance **in run*. (Smith 1983). The other sentences of (34) give productive forms that can generally form statives of this type.
d. Derived statives: Habitual action sentences denote a pattern of recurring situations. There are several linguistic forms for habituals. Frequency adverbials explicitly indicate that a sentence is habitual. The frequency adverbial may be in the same sentence or in a neighboring sentence; see Smith 1978, 1980 for discussion.

Deictics in a sentence may block the habitual interpretation: the sentences of (35) denote events at specified times and cannot accept frequency adverbials that shift to the derived habitual interpretation.

(35) a. I walked to school 3 times that week.
b. John ate an apple that afternoon.
c. # John always ate an apple that afternoon.

Sentences without a frequency adverbial are often interpreted as habitual, as in ***Sam read the newspaper last year***. The habitual reading represents a shift from the basic-level interpretation of a non-stative verb constellation. The shift occurs when pragmatic factors make a specific event reading unlikely. The possibility of shifted readings like this is due to the indeterminacy of the English verb constellation.

English has a specifically habitual form, the phrase *used to*; it appears only with the past tense, as the examples indicate.

(36) a. Bill often used to make speeches.
b. *Bill used to make speeches.

Used to invites a contrastive interpretation (36a) suggests that Bill no longer makes speeches, in the absence of information to the contrary.

Present tense non-stative sentences in English are neutrally taken as habituals: *John reads the newspaper* does not refer to a specific event except on a reportive or dramatic telescoped reading. This is an instance of the general constraint on interpre-

tation of *Present* sentences discussed in Chapter 5. Habitual statives may be formed from verb constellations of all situation types.

Syntactic properties
a. Stative syntax: The pro-verb *do* in pseudo-cleft sentences is incompatible with stative verb constellations: **What John did was know French.* Statives accept *do* in reduced verbphrases, however: *John knew French and so did Mary.*
b. Statives require the perfective viewpoint. Verb constellations of position and location accept the resultative imperfective viewpoint.
c. Statives are compatible with adverbials of duration *I was tired for an hour.* However verbs of duration are dynamic and do not accept basic-level stative verb constellations: **I spent an hour being tired.*
d. Stative constellations of the basic-level type have a specific interpretation in the Present tense: they refer to a particular situation rather than a pattern of situations.

8.4 Temporal location and aspect

Temporal location is signalled in English by tense, modals, auxiliary *have*, and time adverbials. The tenses are past and present; future time is conveyed by the modal *will* or present tense and future adverbials. The temporal forms make reference to Past, Present and Future time. This discussion deals with three areas in which temporal location interacts with aspect: aspectual value and the present tense, the Perfect construction, and the Futurate construction. I assume the systematic account of temporal location outlined in Chapter 5. I also follow the practice of capitalizing times and using lower case for tense; the reason for this is that the times denoted by tense varies according to context.

The verbal auxiliary *have* indicates anteriority. It appears in Perfect sentences (37a). It also appears in certain syntactic contexts as an automatic variant of the past tense, where the inflectional form is syntactically blocked (37b-c):

(37) a. Tom has won the race.
b. Rachel may have left on Friday.
c. Sandy's having won the race surprised her family.

In (37b) the form triggering past tense *have* is the modal *will*; modals cannot be followed by a tensed form. In (37c), the gerundive nominal triggers past tense *have* for the same reason.

The adverbial *since*, which appears with an embedded sentence or temporal nounphrase, requires auxiliary *have*. It is ungrammatical with the simple tense form.

(38) a. Sandy has been here since noon.
b. Sandy may have been fired since we spoke to him.
c. *Sandy is here since noon.

Since specifies the earliest bound of the reference interval; in Present sentences, the latest bound is SpT (see Section 8.4.3 below).

8.4.1 Present tense sentences

The tenses of English code temporal location independent of viewpoint. However, the present tense imposes an interpretive constraint that in effect nullifies the possibility of perfective event sentences. Sentences in the present must indicate open situations (except for marked uses). If the speaker wants to talk about an event in the present, the only viewpoint available is the progressive.

There is a general semantic requirement which blocks a situation with endpoints in the Present (Chapter 5). In English the requirement is reflected in an obligatory shifted, stative interpretation of all Present event sentences with the perfective viewpoint. The derived reading conforms to the constraint that sentences present open situations. Stative sentences have their normal interpretation. They present a state that obtains at the Present time. The progressive viewpoint is unrestricted in present tense sentences, since it presents open situations.

Thus Present sentences are of three types: Statives, which denote States that obtain at the Present time; progressives, which denote ongoing events; perfective non-statives, which denote derived habitual statives. The examples illustrate:

(39) a. Mary knows Greek.
b. Mary is sick.

(40) a. Mary is playing tennis.
b. Mary plays tennis.

a' Sam is feeding the cat.
b' Sam feeds the cat.

(39) presents states that hold at SpT; (40a, a') present ongoing events; (40b, b') have event verb constellations and habitual interpretations. The difference between statives and non-statives in the Present is systematic and can be used as a test for stativity. If a constellation has only a habitual action interpretation with the perfective viewpoint and present tense, it is non-stative.

There are marked uses of the perfective in present sentences. One is the dramatic, sports-announcer use, which telescopes time:

(41) a. Jones runs to third base.
b. Blanche Dubois crosses the room.

These sentences appear in play-by-play reports, stage directions and similar contexts. The telescoped interpretation generally requires a special context. Performatives are another marked case. Verbs such as *christen*, *promise*, and *marry*, have a special interpretation in the present tense. They count as actions, or performances:

(42) a. I promise to mow the lawn every Saturday.
b. I christen this ship the Empress Agatha.

These sentences constitute a promise, and a christening, if they are uttered in appropriate contexts. The performative interpretation is limited to sentences in the simple present tense (Austin 1961). In the progressive or the past, such sentences are not performances but reports of performances: *I promised to mow the lawn every Saturday* does not constitute a promise. In their dramatic uses, these sentences present specific events, unlike the stative readings.

Summarizing, the English temporal system is formally symmetrical: the simple and progressive viewpoints are available for all tenses. But at the semantic level the present tense has a limited aspectual interpretation. The general constraint on endpoints in the Present blocks the perfective interpretation of event verb constellations, allowing only the habitual stative interpretation.

8.4.2 The Perfect construction

The Perfect is a construction with special meanings of temporal location and aspect. Perfect sentences locate a situation prior to Reference Time. They have a stative value, and they ascribe to the subject a property based on participation in the prior situation. In English the Perfect is signalled by the auxiliary *have*. The English construction is unusual in allowing both the perfective and progressive viewpoint in Perfect sentences. The Perfect is introduced in Chapter 5; this section elaborates a topic discussed briefly there, namely, the possible relations between the prior situation and RT, and how aspectual information contributes to interpreting the relation. The English Perfect has been the subject of a great deal of discussion, see McCawley 1971, McCoard 1984, Klein 1992, Michaelis 1994.

The Perfect locates a situation at a time prior to RT; the auxiliary *have* indicates the anteriority of the situation. As the examples show, RT may be located in the Present, Past, or Future.

(43) a. Henry has left.
b. John had already congratulated Bill.
c. Emily will have won the race.

The point of view of the Perfect makes the earlier situation part of the reference interval. The situation—more precisely, its result—is presented as continuing, in effect, into the RT interval. In contrast, the simple tenses locate a situation at RT. This is a conceptual rather than a truth-conditional difference.

The relation between RT and the prior situation is constrained, as noted in Chapter 5. There are two cases. In one case, the time of the prior situation functions as the lower bound for the reference interval. The prior situation must be closed. Alternatively, a time adverbial specifies a reference interval, and the situation occurs within the interval; the situation may be open or closed. Interpretation of Perfect sentences is constrained to just these relations. The constraint explain the interactions of situation type and viewpoint with adverbials of duration and location.

In a Perfect sentence, the prior situation is closed when it sets the lower bound of the reference interval. This is the interpretation of Perfect event sentences with the perfective viewpoint, as in (44):

(44) a. Tom has pushed the cart.
b. Sarah has gone to Arizona.
c. The team has reached the top.

The sentences present closed events, and assert that the events occurred at least once. The perfective viewpoint has scope over the anterior event. This is the typical existential reading of a Perfect sentence. Now consider the corresponding sentences with the progressive viewpoint:

(45) a. Bill has been swimming.
b. Margaret had been drawing a circle.

(45) makes visible an interval of the prior situation, so one would expect an open interpretation. But the sentences convey that these events are closed as well. We take it that Bill is no longer swimming, and that Margaret is no longer drawing a circle. One infers the final endpoint of the event although it is not semantically visible.

If this is correct, we would predict that Perfect sentences with Stative verb constellations would also require a closed, existential interpretation. The prediction is borne out. (46) illustrates, with States of different types, some temporary and relatively permanent:[5]

(46) a. Ted has been a scholar.
b. Jan has believed in ghosts.
c. Nicholas has been rich.
d. Mark has been in Germany.
e. Benjamin has been sick.

The natural reading of these sentences is that the states no longer obtain. We take it that there was a period during which Ted was a scholar, Benjamin was sick, etc. But at SpT the states are over. Supporting this reading, the sentences allow continuations that either make the end of the state explicit, or assume it, as in (47):

(47) a. Mary has been rich—she knows what it's like though she's quite poor now.
b. Mary has been a scholar; but she didn't like the profession and now she sells advertising.
c. Mary has been running, that's why she's out of breath.

The examples suggest that the prior situation does not extend into RT, whether it is presented perfectively or imperfectively.

In Reichenbachian terms, the prior situation must be located at a SitT interval which is prior to Reference Time. This is the first pattern of interpretation, where SitT functions as the lower bound for RT.

The second pattern appears in the Present Perfect. In this construction the prior situation occurs within a reference interval which extends back in time from a Present RT. The prior situation is presented as belonging to the Present in what is known as the 'Extended Now' interpretation (McCoard 1984: ch 4). In Present Perfect sentences the situation may be open, continuing to SpT. The situation may also be closed. The viewpoint and situation type of a sentence determine the readings that obtain.

The interpretations are very clear in sentences with time adverbials. Consider the interpretation of Perfect sentences with *since* adverbials, which state the lower bound of the reference interval.

(48) a. Peggy has been in Asia since January.
b. Tom has walked in the park since noon.
c. Sarah has gone to Arizona since last Wednesday.

(48a), a Stative, has both an open and a closed interpretation. The state may continue from January into Speech Time; this is the 'continuative' reading. The state may also have obtained at least once during the interval specified, the 'existential' reading. This type of indeterminacy is typical of Statives in English. The second example, an Activity sentence, also allows a closed or open interpretation (48b). There may have been an event of [Tom push the cart] between noon and SpT; or, the event started at noon and is still in progress at SpT. (48c) is telic and has only a closed interpretation.

Progressives also allow two interpretations in Perfect sentences with *since* adverbials, though the open interpretation is preferred:

(49) a. Tom has been pushing the cart since noon.
b. Peggy has been writing a letter since noon.

The natural reading of these sentences is that they present ongoing events that continue to SpT. But progressives in this syntactic context also allow the inference that the final endpoint occurred. We can construct a reasonable example. Suppose that a doctor is talking to a nurse about a patient who is plagued with a serious cough. The doctor asks whether the patient has had a coughing bout that day; the nurse replies with (50), a report that no interval of coughing occurred:

(50) He has not been coughing since noon.

In these examples *since* specifies the initial endpoint of an interval that extends to SpT and may or may not continue.

Similar patterns of interpretation hold in Perfect sentences with *for* adverbials. The adverbials indicate either the length of the reference interval or the length of the situation. The situation occurs within a reference interval extending back from SpT, as in (51):

(51) a. Mary has been here for an hour.
b. Mary has stood on her head for an hour.
c. Mary has been standing on her head for an hour.

These sentences are ambiguous between the continuing and existential interpretations. Consider (51b): either at some time prior to SpT there has been a Mary-stand-on-her-head-for-an-hour event; or, as of SpT Mary is standing on her head and has been doing so for an hour (see also Mittwoch 1988).[6] Note that telic events are blocked in this context by the presence of the *for* adverbial.

Other cases in which the situation occurs during the reference interval have Locating adverbials. If there is a Locating adverb in a Present Perfect sentence, it must specify RT (see Klein 1992 for a different but related view). This requirement is a grammatical one. Sentences with adverbs that can only denote a time earlier than RT are ungrammatical, as (52b) illustrates.

(52) a. John has watered the lawn today.
b. *John has watered the lawn yesterday.

This limitation on Locating adverbials and Perfect sentences does not hold for all languages.

Summarizing, there are constraints on the relation between the prior situation and RT in the English Perfect construction. The constraints affect aspectual interpretation. The situation must be closed if it occurs at the end of the reference interval. This leads to the inference of a final endpoint or change out of the state for progressive and stative situations, respectively. If the prior situation occurs during a specified reference interval, then it may be either open or closed. This leads to ambiguous sentences when the situation type is Stative or Activity, or the viewpoint is progressive.

The Perfect construction is derived stative in situation type. I offer a schematic rule of interpretation below. The left-hand side of the rule has a partially interpreted scopal structure: tense and adverbial are in a separate constituent; auxiliary *have* is identified as Perfect, and the verb constellation (VCon) has a situation type value. On the right-hand side of the rule is the derived verb constellation.

(53) [[tense (Adv)] [[perfect *have*] + [View] + [αVCon]]
$\rightarrow$ $_{\text{DVCon}}$[[Stative [αVCon]]

The complete formal analysis of the Perfect would specify that the surface viewpoint has scope over both the internal verb constellation and the sentence as a whole.[8] The complete analysis would also include temporal location information and the participant property.

8.4.3 The Futurate

The Futurate offers a predictive way of talking about the future that differs subtly from the *will*-future. The construction presents a present state of affairs that is preliminary to a future situation. In Futurate sentences all situation types have a special marked nature: they consist of preliminary stages and an eventual change of state into the situation itself. In this section I discuss the temporal location and aspectual meaning of the Futurate. The discussion holds for French as well as for English.

Present tense and a future time adverbial are the hallmarks of the Futurate con-

struction. The Futurate makes a prediction about the future from the vantage point of the present:

(54) a. The troops leave tomorrow.
b. Mary leaves for Seattle next Tuesday.

The Futurate is not the same as a *will* future, e.g. *The troops will leave tomorrow*. I address the differences between them in what follows.

The Futurate requires some kind of schedule, plan, control, or pattern of events; the *will*-future is not so restricted. Thus it is very strange to use the Futurate to talk about a situation that cannot reasonably be predicted, for instance *The general is angry tomorrow, Sam wins the race tomorrow*. This constraint has been discussed by grammarians at least since Jespersen. There are some complications, although it is basically correct. I will have nothing further to say about the schedule requirement of the Futurate.

The first point I want to consider is the temporal location of Futurate sentences, particularly the role of the adverbial. In the simple sentences we have seen, the Locating adverb of a sentence specifies Reference Time; RT is the same as SitT. Therefore to evaluate the truth of a sentence we would consider the state of affairs at RT. The situation is different for Futurates, however. They are located at SpT rather than a future time, in spite of the Future adverbial. Consider how one would evaluate the truth of (55), a Futurate:

(55) Steve rehearses tomorrow.

To evaluate this sentence we do not find 'tomorrow' and ask whether the situation obtains. Rather, we evaluate the situation at SpT to see whether it licenses the prediction about tomorrow. One might ask whether Steve's name is on the rehearsal schedule for that day, whether he will be in town then, etc. The sentence is true if the situation at SpT licenses the prediction. The role of the adverbial in a Futurate is not to establish RT, but to specify SitT.

Additional evidence comes from comparing a *will*-future with a Futurate sentence. Futurate sentences are compatible with a question about possible changes of plan; *will*-futures are not, as (56) illustrates:

(56) a. Steve leaves tomorrow but I won't be surprised if he changes his mind.
b. # Steve will leave tomorrow but I won't be surprised if he changes his mind.

The second sentence is contradictory, perhaps because it suggests that the projected change of mind would take place at the same time as the departure. I will assume then that the RT of a Futurate sentence is SpT; the adverbial specifies another time, a special kind of SitT that pertains to the type of situation involved in Futurates.

Now I turn to the aspectual meaning of Futurate sentences. Notice that the aspectual viewpoints do not have precisely their usual values of presenting closed or open events. Consider (57):

(57) a. We paint the fence tomorrow.
b. We are painting the fence tomorrow.

These sentences do not differ as one would expect: neither of them presents a situation in progress, or as closed. Rather, both focus a preliminary situation which licenses a prediction about a situation tomorrow. The two viewpoints differ in whether the presentation is dynamic or static, like the examples (10 a-b) above.

The verb constellations do not have their usual situation type values, either. Instead, the sentences all present events in preliminary stages, that are distinct from the event proper. (58) illustrates with Futurates of different verb constellations:

(58) a. Mary is in Boston tomorrow. (Stative)
b. They rehearse on Friday. (Activity)
c. John is writing the report in the morning. (Accomplishment)

We do not understand these sentences to say that a process of being, rehearsing or report-writing is actually going on at SpT. Rather, they all present a preliminary stage or process which is expected to have as outcome the situation denoted by the verb constellation.

There is a natural extension of the way a process is associated with an outcome which accounts nicely for the meaning of situation types in these sentences. Suppose that the notion of process includes preliminaries, stages at which plans are made and schedules are organized. The Futurate presents the early stages of such processes; they are associated with an outcome which is the situation itself. The outcome is a change of state into the actual situation. I shall adopt this notion to account for the marked situation types of the Futurate.

The Futurate presents a 'predictive situation,' one that obtains at SpT and has a natural final endpoint. The final endpoint is the change into the actual situation. In Futurate constructions this final endpoint is located at the time specified by the adverbial. Thus all situation types are heterogenous in the Futurate.[9] The heterogenous, predictive situations of the Futurate are marked situation types that must be specified for this construction. They can be recognized with a compositional rule of interpretation. The rule applies to sentences with present tense and a Future time adverbial. It brings the verb constellation within the scope of the temporal expressions, and shifts to a derived, marked situation type interpretation (Smith 1983b).

With heterogenous situation types, the interpretations of the progressive and perfective viewpoints will follow. Both viewpoints focus the preliminary stages that obtain at SpT. The progressive presents an interval of the preliminary stages, while the perfective presents them as a unit. The usual connotations of the progressive viewpoint hold for Futurate sentences: they are sometimes taken as more tentative, or more dynamic, than their counterparts with the simple, perfective viewpoint.

Notes

[1] English has been under study for a long time, and its aspectual viewpoint system has been discussed often. The insights of traditional grammarian Jespersen 1931 are essential; Kruisinga 1925, Poutsma 1928, and Curme 1935 have useful comments and examples. Structuralists Joos 1964 and Twaddell 1965 discuss the distribution and force of the viewpoints. Much work in the semantics of aspect uses English in discussing both situation type and viewpoint; cf Ryle 1947, Vendler 1967, Dowty 1977, Taylor 1978, Vlach 1980. Other references are given throughout the chapter.

Since I draw on the system of English throughout Part I, the material is presented here without extensive discussion.

[2] The semantic value of statives is similar to that of statives with the neutral viewpoint statives in Chinese and Navajo. Both are open informationally.

[3] In certain contexts, Activities in the perfective viewpoint need not terminate, although the perfective presentation conveys implicit bounds. One such context is narrative. See examples (48c), (51b) and note 6 below.

[4] The literature on Achievements contains some contradictory statements about whether they allow the progressive viewpoint. Vendler 1957 claims that they do not allow it. The claim is of course a reasonable one, since the temporal schema of Achievements has no interval; but it is falsified by sentences like(9a-b) which were cited rather quickly by other scholars.

[5] I would like to thank Ted Fernald for drawing the stative Perfect examples to my attention.

[6] The sentence presents a bounded Activity, consistent with the perfective viewpoint. In this context the situation may but need not terminate. The flexibility of Activities is due to the arbitrary final endpoint of the temporal schema. One way to account for these and other cases is to specify that the perfective presents Activities with implicit bounds which may or may not coincide with its initial and final endpoints (the issue is discussed in Smith 1996).

[7] According to some scholars there is also a separate 'resultative' reading of the Present Perfect, as in *The persons responsible have been fired* (McCawley 1971, Michaelis 1994). I do not think it necessary to recognize a separate interpretation for such sentences.

[8] Perhaps the Perfect construction shows that English has a Neutral viewpoint at the level of the derived stative; the explicit viewpoint, progressive or perfective, has scope over the prior situation.

[9] This sense of the term 'heterogenous' is like that of Vendler 1957: it is used for events that involve a change of state.

CHAPTER 9

THE ASPECTUAL SYSTEM OF FRENCH

9.1 Introductory characterization

Aspectual viewpoint is expressed through tense in French.[1] The inseparability of viewpoint and tense creates a close connection, formally and conceptually, between aspect and temporal location. The language has a perfective, an imperfective, and a neutral viewpoint. There is a choice of perfective and imperfective viewpoint in the past tense; the other tenses offer no choice, conveying the neutral or the perfective viewpoint. No viewpoint is dominant formally in the system, because they appear with all situation types. The perfective viewpoint departs from the Universal Grammar formulation: it is available to states, presenting them as closed.

Morphology is relatively simple, with super-lexical morphemes as independent verbs. Temporal location is indicated by tense, adverbials, and periphrastic tenses. There are past, present, and future tenses, and Perfect constructions in all tenses.

This chapter reflects in organization the indissoluble relation between aspect and tense in French. The aspectual viewpoints are presented in Section 9.1, directly followed in section 9.2 by a brief account of the tense system; conventions of use are discussed in Section 9.3; Section 9.4 presents the situation types of French.

9.2 Viewpoint aspect

The perfective, imperfective, and neutral viewpoints are consistently available for all situation types. Of the five languages studied here, this symmetry of viewpoint application exists only in French.

9.2.1 *The perfective viewpoint*

The French perfective presents all situation types as closed. For non-statives, the type of final endpoint varies with situation type: Activities have arbitrary final endpoints, Accomplishments have natural final endpoints, Semelfactives and Achievements are single-stage events. The perfective presentation of States is closed: the final point is a change out of the state. For states, therefore, the span of the perfective viewpoint is greater than the temporal schema of the situation type. Since the perfective schema in Universal Grammar does not include states, this factor that must be stated in the grammar of French.

The preterit *Passé Composé* and the *Passé Simple* are the primary past tenses of French.[2] The *Passé Composé* has a verbal auxiliary (*être* or *avoir*) and the past participle form of the verb; the *Passé Simple* has a characteristic pattern of verb inflection. The perfective viewpoint also appears in other tenses; its aspectual value is consistent in all of them. (1) illustrates for the *Passé Composé*. Tenses are indicated with superscripts in the English translation: preterit *Passé Composé*^{PC}, *Passé Simple*^{PS}, *Présent* ^{Pr}, Futur^{Fut}.

(1) a. Elle a travaillé dix heures ce jour-là.
She worked^{PC} ten hours that day. (Activity)

b. Il s'est assis à son bureau.
He sat down^{PC} at his desk. (Accomplishment)

c. Pierre a frappé à la porte.
Pierre knocked^{PC} at the door. (Semelfactive)

d. La guerre a éclaté .
The war broke out^{PC}. (Achievement)

e. Marie a été malade
Marie was^{PC} sick. (Stative)

The situations are closed in these sentences, with visible initial and final endpoints. The conjunction test confirms this claim. Sentences in the *Passé Composé* cannot be conjoined with assertions that the situations continue: the result is contradictory, as (2) shows.

(2) a. #L'été passé ils ont construit une cabine; peut-être qu'ils la construisent encore.
Last summer they built^{PC} a cabin; perhaps they are still building^{Pr} it.

b. #Ce matin Marie a chanté; peut-être qu'elle chante encore.
This morning Marie sang^{PC}; perhaps she is still singing^{Pr}.

c. #Jean a été malade hier soir et il est malade maintenant.
Jean was sick^{Perf} this morning and he is^{Pr} sick now.

(2c) cannot mean that Jean is now sick with the same sickness that he had earlier. The English translation of this sentence does not adequately convey the intended meaning, since the English and French perfective viewpoints differ on precisely the treatment of statives.

The perfective often appears in sentences with an inceptive or inchoative interpretation. (Inceptives present the initial point of an event, inchoatives the coming about of a state.) Such sentences represent a shift to a derived situation type. The derived reading focuses on the initial endpoint of the situation, while at the basic level of categorization the verb constellation denotes the entire situation. The forms of French are indeterminate between shifted and basic-level readings (Chapter 3). The sentences in (3) illustrate inchoatives for stative verb constellations, with adverbials that facilitate the reading:

(3) a. Paul a été faché quand Jeanne a cassé l'assiette.
Paul was^{PC} angry when Jeanne broke^{PC} the plate.

b. Marie a été heureuse à la vue de son fils.
Marie was^{PC} happy at the sight of her son.

c. Tout d'un coup, j'ai compris!
All of a sudden, I understood^{PC}.

d. A ce moment il a su la vérité.
At that moment he knew^{PC} the truth.

These sentences convey that the situations are open: they may or may not continue into the present: Jean may still be angry, Marie still happy, etc. The possibility seems to contradict the general claim that the perfective consistently presents closed situations. But there is no contradiction here. The shifted reading presents the initial endpoint of the situation with no information as to its continuation. The situation that may continue is the resulting state, not the change into that state. A similar analysis holds for sentences with verb constellation which are categorized as Activities at the basic level; (4) illustrates:

(4) Le président a parlé à la télévision hier soir; et ce matin, il parle toujours.
The president spoke^{PC} last evening on television; this morning, he is^{Pr} still speaking.

Here the situation explicitly continues into the present. At the basic level the verb constellation [Le président parler à la télévision] denotes an Activity, but it functions in this sentence as an Achievement, a change into the activity of speaking.

The *Passé Simple* also conveys the perfective viewpoint. (5) shows that the *Passé Simple* has the same aspectual value as the preterit *Passé Composé*.

(5) a. Louis XIV régna longtemps en France.
Louis XIV reigned[PS] for a long period in France. (Activity)

b. Claire écrivit la lettre.
Claire wrote[PS] the letter. (Accomplishment)

c. L'actrice perdit sa nouvelle broche.
The actress lost[PS] her new brooch. (Achievement)

d. Il frappa à la porte.
He knocked[PS] at the door. (Semelfactive)

e. Ce fut un événement cinématographique.
It was[PS] a cinematographic event. (Stative)

These are closed situations. It is contradictory to affirm continuation; reasonable to mention an arbitrary rather than a natural endpoint. The conjunctions in (6) demonstrate for the Accomplishment example.

(6) a. # Le soir, Claire écrivit la lettre; ce matin elle l'écrit encore.
In the evening, Claire wrote[PS] the letter; this morning, she is still writing[Pr] it.

b. Le soir, Claire écrivit la lettre; peut-être qu'elle ne la terminit pas
In the evening, Claire wrote[PS] the letter; perhaps she didn't finish[PS] it.

The interpretations show that the situations are closed.

Inchoatives also appear in the *Passé Simple*; they lead pragmatically to an open interpretation, as (7) illustrates:

(7) Marie sut la réponse à onze heures.
Marie knew[PS] the answer at eleven o'clock.

Since the forms are indeterminate, the inchoative is not the only possible interpretation. (7) could also be taken as assessing the state of Marie's knowledge at a given moment. In either interpretation, (7) might be followed by an assertion that the state no longer obtains.

(8) . . . mais à minuit elle ne s'en souvint plus.
. . . but at midnight she didn't remember[PS] it any more.

The continuation asserts that the state ended before midnight. Formally, the perfective viewpoint in French requires revision of the general schema given in Chapter 4. The French perfective includes the endpoints of all situations, including statives; therefore the viewpoint statement cannot be made entirely in terms of the temporal schemata of the situation types. Instead it must provide that the initial and final endpoints are available independently. This can be done by identifying the endpoints at the interval associated with an event entity; see Chapters 6 and 7 for discussion. The statement in (9) indicates the information that is required. *I* and *F* refer to endpoints of situations; instantaneous events consist of a single point, *E*.

(9) Statement of the French perfective viewpoint
The perfective viewpoint presents a situation S at an interval I. For times t included in I, there is a time t_i that precedes *I* or *E* and a time t_n that follows *F* or *E*, and S does not obtain at t_i or t_n.

Note that the independence of viewpoint and situation type is essential for this statement. The two-component theory of aspect provides such independence.

9.2.2 *The Imperfective Viewpoints*

The main imperfective viewpoint in French is a general imperfective, the ***Imparfait***. The *Imparfait* is a past tense of the general imperfective type, applying consistently to all situation types. There is also a progressive in French, indicated by the lexical form *en train de*; it does not contrast with other viewpoints and is therefore not part of the aspectual viewpoint system of the language.

The Imparfait

The *Imparfait*, a past tense, is available for all situation types except the Semelfactive. It focuses open situations with neither initial or final endpoints, generally at an interval. Examples are given in (10); I translate with the English progressive when appropriate:

(10) a. L'enfant pleurait.
The child was crying[Impf]. (Activity)

b. Ils bâtissaient une cabine.
They were building[Impf] a cabin. (Accomplishment)

c. Il entrait dans un magasin.
He was entering[Impf] a store. (Achievement)

d. La mer était calme.
The sea was[Impf] calm. (Stative)

For the Achievement (c), the *Imparfait* focuses a preliminary interval. This is common for imperfectives of instantaneous events.

The analysis is supported by considering possible continuations that focus on each endpoint. We ask first whether the *Imparfait* makes visible the final endpoint of a situation. If it does not, we predict that the *Imparfait* would be felicitous with an assertion that the situation continues into the present. As (11) shows, the prediction is borne out:

(11) a. L'été passé ils bâtissaient une cabine; peut-être qu'ils la bâtissent encore.
Last summer they were building[Impf] a cabin; perhaps they are still building[Pr] it.

b. Ce matin elle chantait; peut-être qu'elle chante encore.
This morning she was singing[Impf];perhaps she is still singing[Pr].

c. Il croyait aux fantômes quand il était petit, et il y croit maintenant.
He believed[Impf] in ghosts when a child, and he believes[Pres] in them now.

Since these conjunctions are reasonable, we conclude that the *Imparfait* presents situations without a final endpoint.

The perspective of the *Imparfait* excludes initial endpoints as well. I demonstrate with the subordinating conjunction *quand* (when). This conjunction is a useful diagnostic for endpoint interpretations; see Chapter 4. *Quand* allows a sequential interpretation for two situations, depending on the information made visible by viewpoint. Consider the possible interpretations of (12). The subordinate clause is perfective; if the main clause includes the initial endpoint, the conjunction should allow a sequential interpretation.

(12) Quand l'oncle Jean a frappé à sa porte à minuit, Chantal lisait.
When Uncle Jean knocked[PC] at her door at midnight, Chantal was reading[Impf].

In the conjunction, the events overlap: the reading was in progress when Uncle Jean knocked. (12) cannot be interpreted sequentially to mean that Chantal began to read at the time of the knock. The *Imparfait* does not make visible the initial endpoint of a situation. Semelfactives, e.g. *tousser, frapper, taper* (cough, knock, tap) are not available for the imperfective viewpoint. Verb constellations of this class may appear in *Imparfait* sentences but with shifted interpretations. They are not taken as semelfactive, but as multiple-event Activities or habitual Statives. (13) illustrates:

(13) Maurice lui tapait l'épaule.
Maurice was tapping[Impf] his shoulder.

The sentence can mean that Maurice tapped repeatedly; or that, in a recognizeable pattern of some kind, he often tapped someone on the shoulder. For (13) to be semelfactive, it would have to focus stages preliminary to an instantaneous event, like (8c); but such stages are not available for situations of the Semelfactive type. The facts are due to a general incompatibility between the viewpoint and the situation type (see Chapters 2 and 4). The *Imparfait* requires an interval that excludes endpoints, but Semelfactives consist only of a one-stage event, without preliminary stages. Thus there is no interval for an imperfective focus.

The *Imparfait* does not focus resultative intervals. To see this, consider a sentence about a situation with a clear result:

(14) Louise s'asseyait par terre.
Louise was seating[Impf] herself on the ground.

The only interpretation is the one given: the sentence cannot mean that Louise was in the ongoing state of sitting. To convey such a meaning French uses an adjective, e.g. *Louise était assise* (Louise was sitting). This shows that the *Imparfait* is limited to intervals that precede the final endpoint of a situation, or that precede an instantaneous change of state. The *Imparfait* is the preferred tense for habitual sentences. Like habituals in other languages, this type of sentence may but need not have an explicit reference to frequency or pattern of occurrence. The translations are only approximate; English does not have a viewpoint precisely like the *Imparfait*.

(15) a. Sa mère lui racontait des contes de fées tous les soirs.
His mother would tell[Impf] him fairy tales every evening

b. Dominique partait chaque matin à huit heures.
Dominique would leave[Impf] every morning at 8 o'clock.

c. Autrefois j'étais malade de longues semaines.
In the past, I used to be[Impf] ill for long weeks at a time.

d. Jean continuait à arriver (aux cocktails de mes amis tout l'été).
Jean continued[Impf] to arrive (at my friends'parties all summer).

The derived, habitual interpretation arises when there is pragmatic reason to reject a single event reading, as we have seen (Chapter 3). Typically, such an interpretation is plausible when an adverbial refers to an interval which is much longer than the event, as in (16):

(16) a. L'été dernier il jouait aux èchecs.
Last summer he played[Impf] chess.

b. L'été dernier vous buvez trop.
Last summer you drank[Impf] too much.

Either of these sentences can refer to a particular temporal interval at which the events occurred; or to habitual actions. For instance, (16b) is ambiguous between the reading "You were drinking too much, (at that party we both attended in August)" or "You were drinking too much (at that period of time)." The English perfective is subject to the same ambiguity, as the translations of (16) suggest. Similar ambiguities are common in Russian, in which the imperfective viewpoint is used for both events and habitual statives.

We would not expect the *Imparfait*, a general imperfective unrestricted for situation type, to have the connotations that are typical of the progressive. Recall that the progressive appears neutrally only with non-stative verb constellations. And indeed, the Imparfait differs from the progressive in this. Compare the sentences of (17):

(17) a. Marthe a vecu à Paris.
Martha lived[PC] in Paris.

b. Marthe vivait à Paris.
Martha was living[Impf] in Paris.

(17a) presents a past situation that is closed, whereas (17b) presents a past situation that may or may not still be open. The difference involves endpoints only. (17b) does not have the connotations of activity and the temporary that are typical of the progressive.

Formally, the *Imparfait* conforms quite closely to the general Universal Grammar schema of the imperfective viewpoint. It requires one change, however. In that schema the imperfective spans an internal interval of a situation; but the Imparfait may also span a preliminary interval of an Achievement. The following statement provides for this change. The notation *F/E* refers to the final endpoint of a durative situation or the single point of an instantaneous event.

(18) Statement of the *Imparfait*
a. . . . . *F/E*
///

b. The imperfective focuses a moment or interval of a situation that does not include an endpoint (*E*, *I* or *F*).

This schema allows the *Imparfait* to apply to a situation schema with stages before a final endpoint or single point. The temporal schema for Achievements includes such stages, whereas the temporal schema for Semelfactives does not. Thus the *Imparfait* is correctly blocked for Semelfactive sentences.

The progressive: En train de

This phrase, which appears with the verb *être*, conveys that a dynamic situation is in progress, like the progressive viewpoint. It appears with non-stative verb constellations only, and has the connotations typical of the progressive.[3] The examples illustrate:

(19) a. Il est en train de se ruiner.
He is[Pr] (in the process of) ruining himself.

b. Elle était[Impf] en train de balayer la chambre d'amis.
She is (in the midst of) sweeping the guest room.

c. Jean est en train de atteindre le sommet.
Jean is[Pr] (in the midst of) reaching the top.

d. *Elle est en train de savoir la vérité.
She is[Pr] (in the process of) knowing the truth.

The progressive phrase is not available for habituals, which are stative in situation type.

The progressive *en train de* is not part of the viewpoint system of the language: it is a lexical idiom. The progressive does not contrast distributionally with other viewpoints. Its distribution is semantically based: *en train de* does not appear with tenses that are perfective in viewpoint such as the *Passé Simple* and the *Passé Composé*.

9.2.3 *The Neutral Viewpoint*

The Neutral viewpoint appears in two tenses of French, the *Présent* and the *Futur*. The analysis is based on their pattern of interpretation and the notion of the neutral viewpoint introduced in Chapter 4. I argue there that sentences have the neutral viewpoint when they can be taken as open or closed according to context. The neutral viewpoint spans the initial endpoint and one internal stage of a situation, allowing for the readings that occur and blocking those that do not. Sentences in the *Présent* and the *Futur* are flexible but not unconstrained in interpretation. They allow open and closed readings, a pattern which does not hold for either perfective or imperfective viewpoints. This claim is supported below; see also Chapter 4.

The analysis is somewhat unconventional. It is desirable because it accounts at once for the open interpretations typical of imperfective viewpoints, and those cases which cannot be imperfective.

I begin with the *Présent*. Sentences with this tense generally present open situations, as one expects of present tenses (Chapter 5), and are translated into the English progressive when possible. This point is uncontroversial; the examples illustrate:

(20) a. Jean mange une pomme.
John is[Pr] eating an apple.

b. Jean aime Marie.
John loves[Pr] Mary.

These sentences present open situations, suggesting that the viewpoint of the *Présent* is imperfective. However, there are two other types of examples which show that an imperfective viewpoint analysis for the *Présent* cannot be maintained.

In the context of temporal conjunctions the *Présent* allows a closed interpretation. I demonstrate the interpretation with *quand* (when), which allows open or closed readings. The situations of such sentences are sequential or simultaneous, depending on the viewpoint possibilities. Consider (21):

(21) Marie sourit toujours quand Paul arrive à la maison.
Mary always smiles[Pr] when Paul gets[Pr] home.

The closed reading is not only possible, but more natural than the open one. This shows that the viewpoint of the *Présent* is not imperfective, because imperfectives require an open reading with *quand*.[4]

There are marked uses of the *Présent* which involve closed situations; they include

the reportive or stage direction use (22a), and the performative (22b). They telescope time, violating the general constraint that sentences located at SpT do not present closed situations (see Ch 5).

(22) a. La vedette traverse la scène.
The star crosses[Pr] the stage. (stage direction)

b. Je te promets de prendre au cinema.
I promise[Pr] to pick you up at the movie theatre.

The closed interpretation is not compatible with the imperfective viewpoint.[5] One might try to maintain the imperfective analysis by claiming that the final endpoints are supplied by inference. But this will not account for the second case, in which closed interpretations are natural for sentences in the *Présent.*

The *Présent*, tense, then, conveys the Neutral viewpoint. I now show that the *Futur* also allows both open and closed readings and therefore can be neither perfective nor imperfective in viewpoint. See also the *Futur* examples in Chapter 4. I begin with a *Futur* sentence which has a plausible closed interpretation.

(23) Demain il jouera un robre de bridge.
Tomorrow he will play[Fut] a rubber of bridge.

At the basic-level reading the sentence presents an Accomplishment. There is also an inceptive reading which conveys that the rubber of bridge will start, but gives no other information. Thus the sentence is compatible with a continuation which asserts that the natural final endpoint will not be reached:

(24) Demain il jouera un robre de bridge, mais il ne le finira pas.
Tomorrow he will play[Fut] a rubber of bridge, but he won't finish[Fut] it.

In this context, the first conjunct has an open interpretation; but it may be due to a shifted, inceptive reading of the Accomplishment constellation. If the sentence conveys that the play began, we know nothing about what follows the beginning. Thus the open reading of (24) may due to pragmatic inference rather than semantic information.

Considering a wider range of examples, we also find open interpretations of the *Futur*. Consider (25), discussed in Chapter 4:

(25) Jean entrera dans le bureau quand Marie dormira.
Jean will enter[Fut] the office when when Marie will sleep[Fut].

There are two interpretations of this sentence, Either Marie will already be asleep when Jean enters the office; or she will begin to sleep when he makes his entrance. In the first interpretation, the viewpoint includes an internal stage of the situation; the second requires that it focus the initial stage. Both are possible, since both questions of (26) can be asked:

(26) a. Est-ce qu'elle sera en train de dormir, au moment de l'entré?
Will she be[Fut] in the midst of sleeping?

b. Elle commencera à l'entré de Jean?
Will she begin[Fut] when Jean enters?

The two interpretations are compatible with the neutral viewpoint, but only the second is compatible with the perfective viewpoint. Again, note that the question in (27) has two interpretations (Sten 1952: 56):

(27) Que feras-tu quand il viendra?
What will you do[Fut] when he will come[Fut]?

This question can be translated as "What will you do when he comes?" or "What will you be doing when he comes?"—that is, with a perfective or imperfective understanding of the situation.

Although both open and closed readings are possible with these examples, the closed readings are often much more natural. One might therefore explain the marginal possibility of open readings as due to the general uncertainty of sentences about the future. This point makes it important to demonstrate other cases. In fact, an open interpretation is preferred to the closed in some sentences of the *Futur*. (28) is such a case. In the context of the conjunction *pendant que* the open interpretation is pragmatically preferable:

(28) Pendant que Marie dormira, Jean entrera dans le bureau.
While Marie sleeps[Fut], Jean will enter[Fut] the office.

Taken together, these examples demonstrate that sentences in the *Futur* can present open or closed situations. A related point is made by Kamp and Rohrer. Discussing the viewpoint of the *Futur*, they comment that some *Futur* clauses function like perfectives, introducing new events, whereas others "would have required the Imparfait had the passage been in the past tense" (1989: ch 2, p 83). I conclude, then, that the *Futur* tense expresses the neutral viewpoint.

The Universal Grammar account of the neutral viewpoint provides that it does not apply beyond the temporal schema of a situation. Thus the neutral viewpoint does not generally focus the preliminary stages of Achievements. If the neutral viewpoint did focus preliminary stages, it should be possible to construct a reasonable conjunction of sentences with that viewpoint. The first conjunct would present preliminary stages of an Achievement, the second conjunct would assert that the event did not actually occur. Such a conjunction was presented in Chapter 4; I repeat it here as (29):

(29) # Le cheval gagnera la course mais il ne le gagnera pas.
The horse will win[Fut] the race but he will[Fut] not win.

The sentence is not reasonable, showing that the neutral viewpoint of French con-

forms to the unmarked case.[6] For the formal statement of the viewpoint in Universal Grammar, see the discussion in chapter 4.

9.3 Temporal Location

In this section I consider other features of the French tenses from the point of view of temporal reference and temporal perspective. Temporal perspective refers to the point of view associated with a tense; it is established primarily by the pattern of deictics that the tense allows. Capital letters are used to indicate times.

9.3.1 The Past Tenses

The primary past tenses of French are the *Imparfait*, the preterit *Passé Composé*, and the *Passé Simple*. For each, Reference Time is in the Past, prior to Speech Time. I will discuss the differences between these tenses, looking especially for semantic distinctions between the latter two, which both express the perfective viewpoint.

Traditionally the *Passé Simple* expresses a closed, subjectively punctual act "completed at a determinate moment in the past, independant of any contact this act . . . might have with the present" (Grévisse 1949:719). It locates a situation at a definite time that is remote in some sense from the speaker; it is primarily found in the written language, especially in formal contexts. The *Passé Composé*, also a perfective past tense, appears in both the spoken and written language. It "indicates an act completed at a determinate or indeterminate period in the past and which is considered as being in contact with the present" (ibid). The *Passé Composé* is often characterized as related to the Present, unlike the *Passé Simple*. The two tenses tend to appear in different discourse contexts, and have different histories. In current French they are almost indistinguishable on both syntactic and semantic grounds (Vet 1985, Rohrer 1985).

The *Imparfait* locates situations at a time in the Past. It often needs a supplementary context, anchoring the situation adverbially or with endpoints of another situation (Imbs 1960, Descles 1986). Temporal clauses may perform this function: *J'écrivais une lettre quand Marie m'a appelé au téléphone* (I was writing^{Impf} a letter when Marie called me to the telephone). The *Imparfait* is often used anaphorically, requiring another time to complete its temporal specification. This is not uncommon for the imperfective viewpoint (Chapter 4).

Reference Time: The three tenses locate situations in the Past. The past time functions as Reference Time. It establishes a temporal standpoint which can serve as an anchor for deixis, and for other times. Since the tenses are simple, Reference Time (RT) and Situation Time (SitT) are the same (see Chapter 5). Adverbials specify RT.

(30) a. Hier il était malade.
Yesterday he was^{Impf} sick.

b. Le 15 septembre j'ai perdu mon portefeuille.
On September 15 I lost^{PC} my wallet.

c. Franz Kafka naquit il y a cent ans.
Franz Kafka was born^{PS} one hundred years ago.

All three tenses can serve as temporal anchors for other temporal expressions of Past time.

(31) a. Jean est arrivé lundi à 2 heures. Une heure après il est parti.
Jean arrived^{PC} on Monday at 2 o'clock. He left^{PC} an hour later.

b. Le ministre annonça les mauvaises nouvelles. L'inspecteur célèbre démissionerait le mois prochain.
The minister announced^{PS} bad news yesterday. The famous inspector would resign^{Cond} the following month.

c. Dimanche, Marie était fatiguée. Elle partirait 3 jours après.
On Sunday, Marie was^{Impf} tired. She was^{Cond} leaving 3 days later.

In these examples, a past tense sentence offers a secondary anchor for temporal reference. This is evidence for a Past RT.

The two perfectives appear with temporal adverbials indicating intervals of different lengths. No particular relation between situation and interval is required. There is some tendency for the *Passé Simple* to present situations that occur throughout a given interval, when the situations are "congruent with the temporal interval given or implicit" (Garey 1957: 103). However, in both tenses congruence or inclusion is possible between interval and situation. If the event is shorter than the interval stated, the relation is inclusion. (32) illustrates sentence in which the situation and temporal interval are congruent:

(32) a. Il a joué de 2 à 3 heures.
He played^{PC} from 2 to 3 o'clock.

b. Pendant deux heures, il resta fort calme.
For 2 hours he remained^{PS} perfectly calm.

The *Imparfait* does not lend itself to a relation of congruence between a situation and an explicit interval. This follows from its aspectual value, since the imperfective excludes initial and final endpoints of the situation it focuses. Compare the sentences of (33), which are the same except for tense. The *Passé Simple* is good, while the sentence with the *Imparfait* borders on ungrammaticality.

(33) a. Pendant toute la vie Lucie fut vertueuse.
Throughout her life Lucie was^{PS} chaste.

b. ??Pendant toute la vie Lucie était vertueuse.
Throughout her life Lucie was being^{Impf} chaste.

The difference is blurred in translation but very clear in French.

There are certain discourse situations in which normal semantic constraints like this are suspended, for instance with an adversative continuation such as ". . . *mais elle était aussi étroit d'esprit*" (but she was also mean-spirited). Sentences like (33b) would be acceptable in backgrounded contexts.

Temporal perspective: The perspective of a tense is generally the same as its RT. Perspective is established by adverbials and by verbs of communication and consciousness. In sentences with a perspective other than the moment of speech, a deictic may anchor to that perspective. The result is a shifted deictic reading. Shifted deixis appears in several contexts, among them represented thought and speech, the style *indirect libre.*[7] In this style shifted deixis conveys a special personal perspective.

The *Imparfait* accepts the full range of shifted deixis, whereas the other past tenses do not accept it. "As is widely recognized, the *Passé Simple* never appears in the *style indirect libre*; the Imparfait is the only tense that accepts it" (Banfield 1982: 104). Banfield also notes that the *Passé Composé* does not appear in sentences of this style. The strongest examples have the deictic adverbial *maintenant* (now) in sentences referring to the past; this is one of the hallmarks of the *style indirecte libre*. The examples from Flaubert's *Madame Bovary*, cited by Banfield, illustrate:

(34) a. La maison était bien triste, maintenant! (p 588)
The house was^{Impf} truly sad now!

b. Que faire . . . C'était ^{Impf} dans vingt-quatre heures; demain! (p 592)
What was there to do? It was in twenty four hours; tomorrow!

In these examples the perspective of the sentences is the personal perspective of the narrator. The deictics are anchored to a Past RT, the time of narration. In contrast, *maintenant* never has a shifted meaning with the *Passé Simple* or the preterit *Passé Composé.*

(35) a. *A Jules Verne, trop pondéré, je préférai maintenant les extravagances de Paul d'Ivoi.
To Jules Verne, too sensible, I preferred^{PS} now the extravagances of Paul d'Ivoi.

b. *Vers huit heures il étaient pret. Maintenant il est parti.
At about 8 o'clock he was^{Impf} ready. Now he left^{PC}.

Both are ill-formed: *maintenant* cannot refer to the past time. The examples are from Banfield 1982, Kamp & Rohrer 1989.

However, when other deictic forms are considered the picture becomes more complicated. Not all deictic expressions behave in the same way. There are flexible deictics which may appear, on the shifted interpretation, with all three primary past tenses. The deictics *dans* (in) and *ce matin* (this morning) may have the shifted meaning. Consider the sequences in (36), for instance. The first sentence sets a Past time; it may

be followed by a sentence with *dans* on a shifted meaning in which the adverb anchors to the Past RT:

(36) a. Jean est arrivé lundi à 2 heures. Dans une heure il partait.
Jean arrived^{PC} Monday at 2 o'clock. In an hour he was leaving^{Impf}.

b. Jean est arrivé lundi à 2 heures. Dans une heure il est parti.
Jean arrived^{PC} Monday at 2 o'clock. In an hour he left^{PC}.

c. Jean est arrivé lundi à 2 heures. Dans une heure il partit.
Jean arrived^{PC} Monday at 2 o'clock. In an hour he left^{PS}.

These sequences show another type of shifted deixis that contributes to past perspective; they are not in the *style indirect libre.* (37) presents examples with another deictic, *ce matin* (this morning); in all three the deictic has the shifted meaning typical of personal perspective.

(37) a. Je tombais ce matin au dernier rang.
I dropped^{Impf} this morning to the lowest rank

b. Je suis tombé ce matin au dernier rang.
I dropped^{PC} this morning to the lowest rank

c. Je tombai ce matin au dernier rang.
I dropped^{PS} this morning to the lowest rank

The examples show that the *Passé Simple* and the *Passé Composé* allow shifted perspective with flexible deictics. While *maintenant* as a shifted form has limited distribution, other deictics are not so limited. Similar differences hold for English deictics (Smith 1978).

The facts about shifted deixis suggest that the three tenses establish temporal perspective. Perspective is signalled by shifted deictics such as *dans* and *ce*, and by the presence of verbs of consciousness and communication. However only the *Imparfait* accepts the personal perspective of represented thought and speech.

The *Passé Composé* and the *Passé Simple* have the same distribution and the same semantic meaning. Both convey the perfective viewpoint; both have a past RT, which is equal to SitT; both allow some shifted deixis. They appear in almost the same syntactic contexts though not always in the same discourse contexts; section 9.3.4. There is no evidence that the *Passé Composé* has a closer connection with the speaker and present contexts than does the *Passé Simple.* I now present other examples showing that both tenses may have a close relation to the speaker.

Both perfective tenses appear with a shifted *aller*-future. The *aller*-future indicates a time after SpT that is pertinent to the speaker.

(38) a. Le ballon est allé tomber dans le jardin.
The balloon is going to^{PC} fall in the garden.

b. Le ballon alla tomber dans le jardin.
The balloon is going to[PS] fall in the garden.

These sentences include a time after the reference interval "during which one can envisage the result of the transition" (Vet 1980:80). The *aller*-future is discussed in section 9.3.3. Finally, the examples of (39) show that both tenses can appear in embedded contexts that are explictly related to the present:

(39) a. Pierre crois que l'avion s'est écrasé hier.
Pierre believes that the plane crashed[PC] yesterday.

b. Pierre crois que l'avion s'écrasa hier.
Pierre believes that the plane crashed[PS] yesterday.

These examples show in a slightly different way that both the preterit *Passé Composé* and the *Passé Simple* may be within the personal perspective of the speaker. At the levels of syntax and of semantic meaning, these two past perfective tenses do not differ in a consistent and significant manner.

9.3.2 Present tense

The French *Présent* locates situations at the Present time, SpT. The tense conforms to the general semantic requirement on Present sentences. Present sentences can only report open situations in standard uses: they are incompatible with reports of closed situations (Chapter 5). However, there are marked uses in French as in other languages. The viewpoint of the *Présent* is neutral. The following sentences illustrates the *Présent* for several situation types.

(40) a. Cette boîte contient des bonbons.
This box contains[Pr] candies. (Stative)

b. Maurice pousse sa bicyclette.
Maurice is pushing[Pr] his bicycle. (Activity)

c. J'écris une lettre.
I am writing[Pr] a letter. (Accomplishment)

Habitual statives are presented as continuing situations in the *Présent*, illustrated in (41):

(41) a. Martine prépare le petit déjeuner.
Martine prepares[Pr] breakfast.

b. Paul joue aux échecs tous les vendredis.
Paul plays[Pr] chess every Friday.

c. Elle est souvent amoureuse d'un acteur.
She is[Pr] often in love with some actor.

In these sentences the habitual pattern is asserted to obtain at the present moment and indefinitely around the present, without explicit bounds. The *Présent* is also found in marked uses which present closed situations, telescoping time, as in (22) above.

The Present Perfect Passé Composé

The *Passé Composé* conveys a Present Perfect meaning, in addition to the preterit meaning discussed in the preceding section. As a Perfect construction, the *Passé Composé* situates RT at the Present; SitT precedes RT. The situation type value is stative; the construction ascribes to its subject aproperty due to participation in the preceding situation. I assume the discussions of the Perfect in Chapters 4, 8, and focus here on the characteristics particular to French.

The dual value of the composite auxiliary + past participle functions represents the current stage of a long historical development. At an earlier stage the *Passé Simple* was the only preterit tense. The *Passé Composé* evolved from a complex stative tense which appeared in late Latin and gradually took on both the preterit and perfect functions of the morphologically simpler *Passé Simple*. The latter is now a formal counterpart of the preterit. This pattern of development is common, especially for Romance languages (Harris 1982, Fleischman 1982:195).

The construction appears with all situation types, as in (42):

(42) a. J'ai perdu la clef de la maison hier; je ne peux pas ouvrir la porte.
I have lost[PC] the key to the house yesterday; I can't [Pr] open the door.

b. J'ai déjà mangé; je n'ai plus faim maintenant.
I've already eaten[PC]; I'm[Pr] not hungry any more.

c. Ils ont répété la pièce.
They have rehearsed[PC] the play.

d. Elle a frappé à la porte.
She has knocked[PC] at the door.

e. Elle a possédé un moto.
She has owned[PC] a motorcyle.

Perfect expressions may have adverbials indicating the time of the past situation, e.g., the adverb *hier* in (42a). This is unlike the English perfect, which allows only present time adverbials.

Out of context, a sentence in the *Passé Composé* may be ambiguous between the Perfect and preterit readings. The adverbials *maintenant* and *déjà* disambiguate: they are deictics relating only to SpT, and are incompatible with a preterit interpretation.

The Perfect in French has a consistently perfective viewpoint, so that the final end-

point of the situation talked about must precede RT. For instance, (43) can only denote a Past time, during which we lived here: it cannot convey that we still live here.

(43) Nous avons vecu ici depuis la guerre.
We have lived[PC] here since the war.

The requirement of a closed presentation for all situation types distinguishes the French Perfect. Recall that the English perfect allows stative situations to be open. Thus the English translation of (43) is ambiguous, although the French sentence is unambiguous.

9.3.3 The Future

There are several ways of talking about the future in French: I discuss here the *Futur* tense and the *aller*-future. They differ in temporal reference and in viewpoint. I consider them briefly, establishing the aspectual viewpoint and temporal location of each.

The *Futur* is a distinct tense form which locates situations in the Future at a time after SpT. RT follows SpT, and is equal to SitT, as usual in primary tenses.

(44) a. Jeanne sera riche.
Jeanne will be[Fut] rich. (Stative)

b. Alain courra dans le parc.
Alain will run[Fut] in the park. (Activity)

c. Suzanne écrira le rapport.
Suzanne will write[Fut] the report. (Accomplishment)

d. Paul frappera à la porte demain.
Paul will knock[Fut] at the door tomorrow. (Semelfactive)

e. Maurice remportera le prix vendredi.
Maurice will win[Fut] the prize on Saturday. (Achievement)

Temporal location adverbials in such sentences establish a Future RT. The future time functions as the temporal standpoint of such sentences. Sentences in the *Futur* may have times anchored to the future Reference Time; I assume this without further demonstration (see Vet 1980 for a similar analysis.) The viewpoint of the *Futur* is neutral.

Personal perspective shifts in the *Futur* with flexible deictics such as *dans*, but not with the more limited *maintenant*. *Maintenant* cannot refer to a future time, as (45) shows:

(45) Dans une semaine les vacances commençeront. #Maintenant je serais content.
In a week vacation will begin[Fut]. Now I will be happy[Fut].

As we have seen, certain forms of personal perspective are more flexible than others. There are complex sentences in the *Futur* where the relatively flexible *dans* is anchored to RT, as (46) illustrates:

(46) Léon dira vendredi qu'il partira dans trois jours.
Leon will say[Fut] on Friday that he will leave[Fut] in 3 days.

This sentence has two interpretations: either Leon will leave 3 days from SpT or 3 days from Friday. On the second interpretation the deictic is anchored to the Future time. The fact that *dans* can appear with the Futur is not surprising in view of its flexibility with the *Passé Simple* and *Passé Composé*. For Kamp & Rohrer, the facts about *maintenant* require an analysis of the *Futur* in which RT is located at SpT (Kamp & Rohrer 1989: ch 2, p 82). In the analysis here the feature of personal perspective is independent of RT.

The *aller*-future: This is a construction in which the verb *aller* (go) functions as an auxiliary, without lexical color. It differs in temporal reference and in aspectual viewpoint from the *Futur*. In the *aller*-future RT = SpT, with a future SitT. (47) illustrates with Present adverbials.

(47) a. Maintenant je vais partir.
Now I am going[Pr] to leave.

b. Je vais partir dans 2 jours.
I am going[Pr] to leave in 2 days.

These sentences show that RT is SpT for the *aller*-future. The viewpoint is perfective, again unlike that of the *Futur*. I demonstrate with a *quand*-sentence, which as we have seen is a diagnostic. Consider the interpretation of (48):

(48) Anne va chanter quand Jean va entrer.
Anne is going[Pres] to sing when Jean enters.

This sentence has only an inceptive interpretation: Anne will begin to sing when Jean enters. (48) cannot predict a situation in which Anne will already be singing when Jean enters. This shows that the *aller*-future tense expresses the perfective viewpoint.

The difference between these two futures is whether the future situation is presented by the speaker as directly related to the Present (Fleischman 1982). If the situation is so related, the *aller*-future tends to be used. The construction is similar in many ways to the English Futurate, and may have the same characteristics; see Chapter 8.

9.3.4 Conventions of use

No single aspectual viewpoint can be identified as dominant in French by the distributional criterion of availability. The viewpoints apply to all situation types.

Moreover, the viewpoints are inextricably linked to tenses. Each tense has its own features of temporal reference and perspective, and these features inevitably affect aspectual meaning and aspectual choice. Nevertheless there is some reason to say that the perfective viewpoint dominates the language. There are more tenses with the perfective viewpoint than any other. The *Imparfait* is imperfective, the *Présent* and *Futur* are neutral; all the other tenses are perfective, including the perfect tenses and non-primary tenses.

Pragmatically the perfective viewpoint is dominant: if we ask whether the perfective viewpoint is standardly used when the situation warrants, the answer is clearly affirmative. When the dominant viewpoint of another language is translated into French, one of the perfective tenses is consistently chosen as its counterpart. For instance, the dominant, unmarked viewpoint of Russian is the imperfective; Dupont 1986 notes that Russian imperfective is usually translated with a French perfective viewpoint.

The *Imparfait* is standardly used for presenting situations in progress, characteristic states, and habitual actions. Yet the *Imparfait* appears with interpretations which do not accord directly with the semantic meaning of the viewpoint. Conventions of use provide an explanation. In fact there are several marked uses of this tense which are conventionally accepted.

In one marked use, the *Imparfait* appears in a sentence which presents a closed situation indicated adverbially. The *Imparfait* functions to characterize the interval, as Ducrot convincingly argues. This marked use of the *Imparfait* is shown in (49), from Ducrot 1979.

(49) Les iraniens s'en prennent maintenant aux interêts américains. Hier deux banques américaines étaient saccagées.
The Iranians are now turning[Pres] against American interests. Yesterday two American banks were[Impf] pillaged.

In these examples, situations that would standardly be taken as having final endpoints are presented as continuous throughout the period talked about. In (49) for example the period of *maintenant* includes recent days, and the two attacks in some sense cover the period. As Ducrot puts it, the events characterize the period talked about regardless of where their actual endpoints fall. Here the presentation of the *Imparfait* presents the closed situations as in effect occurring throughout an interval, although they do not do so literally, that is, in the semantic representation associated with the sentences.

Another conventional marked use is the *Imparfait de Rupture*. It presents a closed situation which constitutes a clear break with the preceding events. The *Imparfait de Rupture* often appears at the end of a sequence of perfective sentences. The examples illustrate. (50a) appears in a narrative "Le Mariage du lieutenant Lare", by Maupasssant, which is almost entirely in the *Passé Simple*. The marriage itself is presented in the *Imparfait* (LeGuern 1986); (50b) presents a sequence from "La Dame aux Camélias" by Dumas Fils.

(50) a. Un an après, jour pour jour, dans l'église Saint-Thomas d'Aquin, le capitaine Lare èpousait Mlle Louise-Hortense Geneviève de Ronfi-Quédissac.
One year later, on the same day, in the Church of St. Thomas Aquinas, Captain Lare married[Impf] Mlle. Louise-Hortense Geneviève de Ronfi-Quédissac.

b. Il me sourit et me tendit la main . . . avant de sortir, Armand prit une lettre fort épaisse, adressée a son père, et confidente sans doute de ses impressions de la nuit. Une demi-heure après nous arrivions à Montmartre.
He smiled[PS] at me and gave[PS] me his hand . . . before leaving, Armand took[PS] a thick letter, addressed to his father, which no doubt confided his impressions of the night. An hour later we arrived[Impf] at Montmartre.

By putting the final statement in the *Imparfait*, the narration presents it as characteristic of a particular period. Other connotations may also arise, depending on the context. Here the *Imparfait* characterizes the period by the final event; it is another example of the characterizing attribution, although not noted as such by Ducrot. The *Imparfait de Rupture* often contains an indication of the following moment, which completes the break with the preceding material (Imbs 1960: 903).

There are other uses of the *Imparfait*, some of which require interpretation and augmentation of the temporal schema we have given (Tasmowski-de-Ryck 1985). These uses do not show that the approach of an invariant meaning is wrong, nor that the temporal schema given is wrong, but rather that pragmatic conventions of use are a necessary complement to the approach.

The two past perfective tenses have been discussed at length in the literature. It is agreed that the preterit *Passé Composé* appears in a wide range of spoken and written contexts and is the more neutral of the two. The *Passé Simple* is used mainly in the formal written language. The differences between these tenses are beyond the scope of this book, because they do not involve the semantic meaning of the aspectual forms. They are a matter of stylistic convention—that is, patterns of consistent choices. Two main patterns of consistent choice were distinguished by Benveniste (1966: 239 et seq). He claimed that there are consistent uses in two types of text, *discours* (discourse) and *histoire* (history). *Discours* directly involves the speaker and tends to include personal pronouns and deixis; *histoire* is remote from the speaker. Simplifying somewhat, the *Passé Composé* is said to be characteristic of *discours*, while the *Passé Simple* belongs to *histoire*. This view has been enormously important in the study of text and discourse (cf Weinrich 1972, Hamburger 1973, Banfield 1982).

In neither current practice nor current theory are the two past tenses distinct, however. Both the *Passé Composé* and the *Passé Simple* appear in written French of all kinds, including newspapers and mystery stories (Waugh & Monville-Burston 1986). In fact both tenses often appear in the same passage, with no appreciable difference of tone. There is simply no class of contexts in which one tense appears but the other does not. Perhaps in a further stage of development of the language one of these tenses will develop a meaning and/or set of contexts of use which distinguish it from the other. Moreover, the distinction between *discours* and *histoire* can no longer be main-

tained. Discourse which directly involves the speaker is not separable in any consistent manner from other discourse. This is to be expected, according to current theories of communication and narratology. Bakhtin stresses the dialogic nature of all kinds of discourse, emphasizing that the speaker and receiver are all-pervasive in text and discourse (1981). Moreover, some theorists argue that the narrative essentials are not limited to a particular type of text. At an abstract level, the same basic rhythms of time and events underlie all human activity, conscious and automatic, including human discourse (Holquist 1989).

9.4 Situation Aspect

9.4.1 Temporal properties in sentences of French

I summarize here the syntactic properties of French that correlate with the temporal features of situation types. These properties underlie the characterizations of the situation types, and can be used to construct syntactic tests for situation type.

Dynamism: There is a cluster of syntactic properties which hold for sentences of the non-stative situation types. Such sentences may appear with forms associated with agentivity: subject agency adverbials, instrumentals, embedding under verbs such as *forcer à* (to force) and imperative constructions. These are generally compatible with with non-statives, and incompatible with statives. The pro-verb *faire* (do) as in *faire de même* (do the same thing) is associated with dynamism and does not appear with stative verb constellations (Guenthner et al 1978). The progressive *être en train de* form is available only for non-statives. This cluster of syntactic properties constitutes 'dynamic syntax' for French.

Completion and duration: these notions are expressed with adverbials and main verbs. Simple duration is indicated by the adverbials *pendant* (for) and *de X à Y* (from X to Y) and is associated with atelic situation types. Adverbials such as *dans une heure* (in an hour) indicate completion within an interval, and are associated with telic situation types. There is a completive question form *en combien de temps* (How long did it take to. . . .) With a complement referring to time the verb *mettre* is completive, and is associated with telic sentences. The verbs *finir de, cesser de, prendre, mettre à* (finish, stop, begin, start) are associated with both completion and duration.

Non-detachability: The non-detachable relation between process and outcome can be demonstrated in French with perfective and imperfective sentences. For non-detachable situations, the truth of a sentence in the *Passé Composé* entails the truth of the corresponding sentence in the *Imparfait*. In addition, the adverb *presque* (almost) indicates the property of non-detachability. For non-detachable situations, sentences with this adverb are ambiguous: the adverbial may pertain to the beginning of the process or to the outcome.

I now discuss the realization of the situation types in French. I focus on independent clauses. For simplicity, the examples of this section are all given in the *Passé Composé*.

9.4.2 Activities

Activity sentences present durative, atelic events, as (51) illustrates:

(51) a. Marie a couru.
Mary ran^{PC}.

b. Elle a cherché sa clef.
She looked for her key ^{PC}.

c. La roue a tourné.
The wheel turned^{PC}.

These verbs have the intrinsic feature [Atelic].

Sentences with the Activity value often have intrinsically telic verbs and a nominal that does not refer to a countable quantity. Such sentences refer to processes that are not finite. Nominals denoting an uncountable, nonspecific quantity are formed with *de*.

(52) a. Pierre a sorti du papier de son bureau.
Pierre pulled^{PC} some paper out of his desk.

b. L'enfant a mangé des pommes.
The child ate^{PC} some apples.

c. Jean a planté beaucoup de bégonias.
Jean planted^{PC} lots of begonias.

Derived Activities of multiple events may be formed from verb constellations that are stative at the basic level of categorization. (53) and (54) illustrates. They present ongoing events which consists of multiple sub-events of different types:

(53) Les ouvriers commencent à avoir des maisons.
The workers are^{Pr} beginning to own their houses.

(54) a. La roue a tourné toute la journée.
The wheel turned^{PC} all day.

b. Ses petits yeux clignotaient rapidement.
His small eyes blinked^{Impf} rapidly.

Since the sub-events are uncountable these situation types have no natural final endpoint, and constitute Activities. Sentences with such verb constellations may be indeterminate in situation type if they do not refer specifically to repetitions or multiples, e.g. *La roue a tourné hier* also has an Accomplishment reading.

Activities have dynamic syntax, allowing expressions of agency and volition, and the pro-verb *faire*. Since they are atelic, Activities are compatible with expressions of simple duration, but not expressions of completion. (55c) requires a shifted interpretation.

(55) a. Marie a couru pendant une heure.
Mary ran[PC] for an hour.

b. Marie a couru de 3 à 4 heures.
Mary ran[PC] from 3 to 4 o'clock.

c. ? Marie a couru en une heure.
Mary ran[PC] in an hour.

It is barely possible to interpret (55c) as referring implicitly to a particular distance that constituted the goal of Mary's run. In French a pronoun would normally indicate such an endpoint, however, making this interpretation difficult. Activity constellations are compatible with verbs of termination such as *cesser* and *passer* (Borillo 1988).

(56) a. Marie a cessé de courir.
Mary stopped[PC] running.

b. Il a passé quelques heures à nager .
He spent [PC] several hours swimming.

In contrast, Activities are incompatible with verbs involving completion: the sentences of (57) require a shifted reading

(57) a. Jean a mis quelques heures pour nager.
Jean took[PC] several hours to swim.

b. Marie a fini de courir.
Mary finished[PC] running.

Sentences like these are reasonable on an elliptical reading in which the swim, or the run, is understood to have an unstated natural final point. Other verbs involving completion such as *achèver* (complete) are also unacceptable with atelic verb constellations. Activities '...do not have to wait for a goal for their realization, but are realized as soon as they begin" (Garey 1957: 106). This entailment pattern can be demonstrated in French through related sentences about an Activity.

(58) a. Jean marchait.
Jean was[Impf] walking.

a' Jean était en train de marchait.
Jean was[Impf Prog] walking.

b. Jean a marché.
Jean walked[PC].

The imperfective and progressive entail the perfective sentence, and vice versa. The same is true of sentences with super-lexical verbs which focus on beginnings or endings, as in (59):

(59) a. Jean a cessé de marcher.
Jean stopped[PC] walking.

b. Jean a marché
Jean walked[PC].

Other super-lexical verbs that behave in the same manner include *commencer* (to begin).

Verb constellation patterns

I follow the principle for intrinsic features of Chapter 6: the intrinsic feature of a verb depends on its value in a minimal constellation.

a. Verbs with the [Atelic] feature form Activity constellations with NP or Locative complements, e.g. *Jean a marché dans le bois* (Jean walked in the wood). The combination of verb and preposition must be considered, rather than the latter alone: *sur* (on), for instance, may have telic or atelic complements (Boons 1985).

(60) a. Annibal a marché sur Rome.
Hannibal marched[PC] on Rome

b. Max a marché sur la terrasse.
Max walked[PC] on the terrace

b. Verbs with the [Telic] feature form Activity constellations with uncountable nominals, as in *Il a joué au tennis* (He played tennis).

c. Prepositions affect the aspectual value of the verb with which they combine. For instance, *penser à* (think about) is an Activity, while *penser que* (think that) is stative.

d. Multiple-event Activities are formed from constellations associated with Accomplishments, Semelfactives, or Achievements. Temporal adverbials may indicate a multiple event, as in (61a); or the multiple reading may be pragmatically suggested if there is a great disparity between the interval required for a single event and the adverbial interval, as in (61b). The examples illustrate:

(61) a. Le garçon a toussé plusiers fois.
The boy coughed[PC] several times.

b. Il a frappé à la porte pendant une heure.
He knocked[PC] at the door for an hour

e. Durative adverbials produce derived Activities with telic verb constellations, e.g. *Il écrit une lettre pendant une heure* (He wrote a letter for an hour). The durative adverbial, which has an atelic aspectual value, overrides the value of the verb constellation. The event is taken as a process that is not associated with an outcome. Other durative adverbials have the same effect, as in (62):

(62) J'ai lu ce livre hier de 2 heures à 4 heures.
I read[PC] that book yesterday from 2 to 4 o'clock.

Syntactic features
a. Activities have dynamic syntax.
b. They are compatible with expressions of duration.
c. They are incompatible with expressions of completion.

9.4.3 Accomplishments

Accomplishments are durative events consisting of a process and an associated outcome. Examples include:

(63) a. Jean a dessiné un cercle.
Jean drew[PC] a circle.

b. Marie a fermé la porte.
Mary closed[PC] the door.

c. Tom a mangé un sandwich.
Tom ate[PC] a sandwich.

d. Ils ont construit une cabine.
They built[PC] a cabin.

These Accomplishments have [Telic] verbs and finite, countable NPs.

Sentences of this situation type may also have an atelic verb and a countable object or other complement. Consider the verb *jouer* (to play): it is telic with an uncountable direct object, atelic with a countable object, as in these well-known examples from Garey (1957:108):

(63) a. Pierre a joué du Mozart.
Pierre played[PC] some Mozart.

b. Pierre a joué un concerto de Mozart.
Pierre played[PC] a Mozart concerto.

(63a) is an Activity, (63b) is an Accomplishment. Accomplishment must have at least one countable argument in the verb constellation.

Accomplishments have dynamic syntax. They are compatible with expressions of dynamism and agency, and with completive adverbials and main verbs, as in (64):

(64) a. Jean a dessiné un cercle en une heure.
Jean drew[PC] a circle in an hour.

b. Jean a mis une heure à dessiner un cercle.
Jean spent[PC] an hour drawing a circle.

c. Il a employé toute une journée à vérifier ses comptes.
He spent[PC] a whole day checking his accounts.

Completives involve both duration and a natural endpoint. Other completives are *achèver* (achieve) and *finir de* (finish). These expressions are incompatible with atelic situations.

Accomplishments are incompatible with adverbials of simple duration. The combination triggers a shifted interpretation in which the verb constellations refer to atelic rather than telic events

(65) Marie a dessiné un cercle pendant une heure.
Marie drew[PC] a circle for an hour.

In (65), Marie engaged in circle-drawing-activity, an atelic event.

The entailment pattern typical of Accomplishments can be demonstrated in French with the imperfective or the progressive *en train de*. If a perfective sentence is true at a given interval, then the corresponding imperfective is true for that interval. Thus (66a) entails (66b) for the same interval but not vice versa.

(66) a. Jean a peint un portrait.
Jean painted[PC] a portrait.

b. Jean peignait un portrait.
Jean was painting[Impf] a portrait.

Verb constellation patterns
a. Verbs with the properties [Telic] [Durative] and an associated complement are Accomplishments, e.g. *Elle a ecrit une lettre* (She wrote a letter), *Il a fermé la porte* (He closed the door).
b. [Atelic] [Durative] verbs and directional complements belong to the Accomplishment class, *Il a couru à la gare* (He ran to the station).
c. Inchoatives are formed with *se* (pronominal verb constructions). The situation type is Accomplishment for gradual processes, e.g. *s'ennuyer* (become bored).
d. Completive adverbials produce derived telics from Activity constellations, e.g. *Suzanne courut dans une heure*. The event is understood to have an implicit natural endpoint.

Syntactic features
a. Accomplishments have dynamic syntax.
b. They are incompatible with adverbials of simple duration.
c. They are compatible with expressions of completion.
d. They are ambiguous with *presque* (almost) and *faillir* (almost V).

9.4.4 *Semelfactives*

This situation type consists of single-stage atelic events, as in (67).

(67) a. Hélène a frappé à la porte.
Helen knocked[PC] at the door.

b. L'oiseau a battu des ailes.
The bird flapped[PC] its wings.

Semelfactives allow agent-oriented adverbials and the imperative. They are incompatible with expressions of duration, simple or completive. One cannot *cesser* (stop) or *V pendant une heure* (do something for an hour) for a one-stage atelic event. Semelfactives allow adverbials of implied duration, e.g. *lentement* (slowly), on an ingressive interpretation (Chapter 5).

They do not allow the imperfective viewpoint. When Semelfactive verb constellations appear with the *Imparfait*, the only interpretation is a shifted one, that of a multiple-event Activity consisting of Semelfactives as internal stages. Thus a sentence like *Hélène frappait à la porte* has only the multiple-event reading and cannot mean that Helene was engaged in the preliminary stages of giving a single knock.

Verb constellation patterns
Semelfactives have verbs that are intransitive (*tousser, frapper à la porte*) or transitive (*battre des ailes*). Since the event is single, all nominals that appear in a Semelfactive sentence must be quantized.

Syntactic features
a. Semelfactives have dynamic syntax.
b. They do not allow the imperfective viewpoint.
c. They are incompatible with expressions of duration.
d. They are incompatible with expressions of completion.

9.4.5 *Achievements*

Achievements are instantaneous changes of state, as (68) illustrates:

(68) a. Lise a cassé l'assiette.
Lise broke[PC] the dish.

b. Jean est arrivé au sommet.
Jean reached[PC] the top.

c. Elle a retrouvé sa clef.
She found[PC] her key.

Achievements are conceptualized as single stage events. They often have an associated process, but the process is not considered to be part of the event. For instance, to [arriver au sommet] an approach of some kind is necessary, but the approach is a separate event. In this case the lexical span of the verb constellation clearly focuses the change of state. Many cases are less clear, especially when they refer to changes of state that usually involve a gradual process:

(69) a. Le beurre a fondu.
The butter[PC] melted.

b. Marie s'est fachée.
Marie became[PC] angry.

These examples may be seen notionally as Achievements or as Accomplishments, since they involve processes that may be seen as separate from, or related to, the outcome. Syntactic tests suggest do not completely resolve the issue because the sentences have characteristics of both situation types; see Chapter 3.

Achievements are compatible with certain completive adverbials and verbs, on an ingressive interpretation. For instance, the adverbial *dans* (in) is felicitous with this situation type: *Nous sommes arrivés au sommet en trois heures* (We reached the top in 3 hours), as is the verb *prendre* (take) *Il lui a pris quelques minutes pour se décider* (It took him several minutes to decide). These have the interpretation that the change of state occurred at the end of the interval.

Verbs of duration are incompatible with Achievements, however, including *commencer à, cesser de, finir de*. Achievements cannot occur with the durative adverbials *pendant, de X à Y*.

Achievements have the features of dynamic syntax.They accept the imperfective viewpoint, with the focus on preliminary, detachable stages, as in (69) from Imbs 1960:92:

(69) a. Vous avez de la chance de me trouver: je sortais.
You are[Pres] lucky to find me: I was leaving[Impf].

Verb constellation patterns
Basic-level Achievements are formed mainly from verbs with the intrinsic feature [Instantaneous]; derived inchoatives, however, may have durative verb constellations, telic or atelic.
a. Verb constellations mayhave intransitive or intransitive verbs.
b. The pronominal *se* functions as an inchoative (this is not its only function in the language), forming Achievements.

c. Derived Achievements are formed from stative or accomplishment verb constellations. As noted above, stative constellations may function as inchoatives. The inceptive reading arises naturally with the co-occurrence of momentaneous adverbials and Accomplishment constellations:

(70) Nous avons traversé le fleuve à 4 heures.
We crossed^{PC} the river at 4 o'clock.

In the inceptive interpretation of this sentence, the crossing began at 4 o'clock and (one infers) continued until we reached the other side.

Syntactic features
a. Achievements have dynamic syntax.
b. With the *Imparfait* they focus preliminary, detachable stages.
c. They are incompatible with expressions of duration.
d. They allow completive expressions with ingressive interpretation.

9.4.6 Statives

Stative constellations in French may be verbal or copular with adjectives, predicate nominals, or prepositional phrases. Examples of the main Stative types follow:

(71) a. Je crois aux fantômes.
I believe^{Pr} in ghosts.

b. Catherine possède un moto noir.
Catherine has^{Pr} a black motorcycle.

c. Les fusées sont déjà installées.
The rockets are^{Pr} already installed.

d. Il est à la maison.
He is^{Pr} at home.

The statives of French include generic sentences, which do not have distinctive morphological or syntactic forms. Generics refer to classes and contain individual-level predicates. Certain predicates appear only in reference to classes, e.g. *répandu* (widespread) as in *Les idées conservatrices sont répandu* (Conservative views are widespread). Other predicates appear in both stage-level or individual-level uses, as in this example of a generic statement from Lamiroy 1987.

(72) Le gâteau au chocolat continue à être apprécié aux Etats-Unis.
Chocolate cake continues^{Pr} to be appreciated in the United States.

Habitual sentences denote a recurring pattern of events or states, rather than a particular situation. They appear with all situation types.

(73) a. Simon répare des magnétophones souvent.
Simon often repairs^{Pr} tape recorders.

b. Jean boit du vin tous les jours.
Jean drinks^{Pr} wine every day.

As noted above, a sentence may be taken as habitual for pragmatic reasons even if it has no explicit indication to this effect.

The syntactic properties of Statives follow from their semantic properties. Statives are not compatible with forms involving agency. Main verbs such as *forcer à* (force), which require an embedded non-stative, and imperatives, are odd with statives. The examples illustrate:

(74) a. *Marie a incité Jean à etre blond.
Marie induced^{PC} Jean to be blond.

b. *Ayez faim!
Be^{Pr} hungry!

With certain stative constellations imperatives are entirely acceptable, e.g. *Croyez-moi*! (Believe me!). They are not stative, but demands for a change into the state of believing. They represent a derived use of a stative verb constellation. Adverbs of manner which characterize the unfolding of events in time are odd with statives:

(75) a. *Je suis lentement jaloux.
I am^{Pr} slowly jealous.

b. *Peu à peu la salle est vide.
Little by little the room is^{Pr} empty.

The syntax of dynamism involves forms associated with successive stages and verbs that take time. In French these forms include the progressive form *en train de* and the pro-verb *faire*. Neither are compatible with statives:

(76) a. *Elle est en train d'être mince.
She is^{Pr} in the process of being thin.

b. *Marie avait faim et Pierre faisait de même.
Mary was^{Impf} hungry and Pierre did^{Impf} the same.

c. *Marie est fachée et Pierre le faisait aussi.
Mary was annoyed^{PC} and Pierre did^{PC} so too.

Temporal adverbials involving simple duration are compatible with stative verb constellations:

(77) a. Elle est malade depuis minuit.
She has been sick[PC] since midnight.

b. Pendant deux heures, il resta fort calme. (Maupassant, *La Main d'Ecorché*)
For 2 hours he remained[PS] entirely calm.

However, *pendant* may be associated with dynamism as well as simple duration. In such cases it is not compatible with statives. For instance, verb constellations with the copula and a past participle are often ambiguous between a stative and dynamic interpretation. But with *pendant* the non-stative reading is the only possibility. (78), for instance, does not have a stative interpretation (Vikner 1985).

(78) Pendant quelques heures, ces établissments ont été fermés.
During certain hours, these establishments have been[PC] closed.

This example contrasts with statives of the same global structure, such as *Les fusées sont déjà installées* (71c above), which are ambiguous. Verbs and adverbials associated with completion are not compatible with statives, as (79) shows; 79a has an embedded infinitive:

(79) a. *Marie a passé plusiers nuits à être à l'hôtel.
Marie spent[PC] many nights being at the hotel.

b. *Il a achèvé une maladie.
He finished[PC] an illness.

c. *Le livre a pésé cinq kilos en deux heures.
The book weighed[PC] 5 kilos in two hours.

It is possible to construct grammatical, non-stative sentences that have stative verb constellations and completive adverbials. The adverbial forces a shifted, inchoative reading for the stative constellation, as in, *Nouns avons été à la gare en deux heures* (We were at the station in two hours.) Stative sentences may appear with perfective, general imperfective, and neutral viewpoints, and allow both open and closed aspectual interpretation.

Verb constellation patterns
a. Verbs with the intrinsic feature [Stative] are intransitive and transitive (*connaitre, savoir*). French has many stative verbs, where the corresponding English form is adjectival. For instance, the following French verbs are adjectives in English: *ambitionner* (to be ambitious), *jalouser* (to be jealous), *se passioner de* (to be passionately interested in) *patienter* (to be patient), etc. As statives in the perfective they present closed situations; as inchoatives the pattern of the language allows them to present open situations. The copula *être* has the intrinsic feature [Stative].
b. Prepositions affect situation type: some verbs are stative with locative complements, non-stative with other complements. For instance, *vivre à la campagne* (live in the country) is stative; with other complements the verb also appears in non-stative constellations, e.g. *vivre de ses revenues* (live from their revenues). Such examples show the need for lexical features that can be assessed in combination by compositional rules.
c. With the pronominal *se* verb constellations of position and location may be stative.

(80) a. Un mât se dresse sur la place.
A flagpole is[Pr] set up in the square.

b. La caisse se cache sous un drap.
The box is[Pr] hidden under a sheet.

d. Habituals are derived statives that denote a situation which recurs on a regular basis of some kind. Habitual statives are most commonwith in the non-perfective tenses, and do not require a freqeuncy adverbial. With a frequency adverbial, habituals appear in the perfective tenses. Habituals may be derived from all basic-level verb constellations.

Syntactic features
a. Statives have non-dynamic syntax.
b. They are compatible with adverbials of duration, but not verbs such as *mettre* which involve both duration and dynamism.
c. They are incompatible with expressions of completion.

Notes

[1] There is an extensive traditional and modern literature on the aspectual system of French, including Grévisse 1949, Garey 1957, Imbs 1960, Klum 1961, Sten 1962, Vet 1980, Benveniste 1966, Guenthner et al 1978, Hoepelman & Rohrer 1980, Kamp & Rohrer 1989.

I would like to thank Jeanne Whitaker for many interesting discussions on this and related topics over a period of years, and for careful reading of this Chapter.

[2] I ignore here the perfect tenses *Plus-que-parfait*, the *Passé Surcomposé*, and the *Futur Anterieur*; and the conditional tenses, *Conditionnel I* and *Conditionnel II*.

[3] Not all speakers may agree that *en train de* can appear with Achievements. Native speakers have told me that (19d) is impeccable; Guenthner & Rohrer 1980 found otherwise (1989: Ch 2, §5).

[4] I use a habitual stative to make the point here, since the present tense does not allow closed readings in its non-stative use. Compare the following examples, which have an *Imparfait* and a *Passé Composé* in the main clause of a conjunction with *quand*:

(i) Anne chantait quand Paul est arrivé.
Anne was singing[Impf] when Paul arrived[PC].

(ii) Anne a chanté quand Paul est arrivé[PC].
Anne sang [PC] when Paul arrived[PC].

In (i), the only interpretation is that Anne was already singing at the time of Paul's arrival.

[5] Kamp & Rohrer, in discussing similar examples, propose that the *Présent* has a perfective aspectual value in such cases. In their system, the feature [-Prog] must be associated with the the *Présent* in reportive speech, whereas the feature [Prog] is associated with it otherwise.

6 Sentences in the *Présent* can focus the preliminary stages of Achievements, and therefore represent marked instances of the neutral viewpoint. (iii) for instance refers to preliminary stages rather than an actual win, as the translation indicates.

(iii) Le cheval gagne la course.
The horse is winning the race.

The general constraint on Present sentence interpretation blocks the closed interpretation of (iii).

7 Represented speech, or *le style indirect libre*, appears in many languages. It has been discussed most extensively for French, in particular by Lips 1926, Hamburger 1973.

CHAPTER 10

THE ASPECTUAL SYSTEM OF RUSSIAN
with Gilbert C. Rappaport

10.1 Introductory characterization

Aspectual choice is salient perceptually and morphologically in Russian. The formal contrast of perfective and imperfective viewpoints appears in all finite verb forms and many nonfinite finite verb forms as well. Speakers are keenly aware of aspectual choices and their effects.[1]

Verbal affixes contribute to both viewpoint and situation type; in fact, most aspectual information appears in the Russian verb. The verb has an elaborate morphology in which affixes are added to a lexical root. There is a good deal of morphological and lexical idiosyncrasy, so that the contribution of a particular morpheme to the aspectual value of a sentence is not always obvious.[2] The two-component approach brings this problem into sharp focus and suggests a principled solution to it. There are two viewpoints, Perfective and Imperfective. The Perfective includes both endpoints of dynamic situations, and has a requirement of specificity. The Imperfective, which excludes endpoints, is the dominant viewpoint in Russian because it is formally available for all situation types; the perfective is unavailable for Statives. The asymmetry between the aspectual viewpoints is both formal and conventional. We devote some time to this topic, partly through an account of the main conventions of aspectual use. The five situation types are covert categories in Russian. Tenses and adverbials indicate temporal location.

The traditional analysis of the Russian viewpoints is due to Roman Jakobson (1932); we follow him in the essential idea that viewpoints have invariant semantic meanings and that there is a contrastive relation between them. Jakobson uses definitions that are both semantic and pragmatic. He defines the perfective as "...concerned with the absolute completion of [the narrative event]" (Jakobson 1957: 48), and the

imperfective as negative in value. Our approach differs from his in distinguishing a semantic and a pragmatic level of meaning. At the semantic level, positive meanings are associated with the viewpoints according to their temporal properties. The relation between the viewpoints is analyzed at the pragmatic level. Pragmatic conventions account for the contrastive value of the viewpoints; see Chapter 4.

In this chapter we focus mainly on the aspectual viewpoints and their ramifications. We devote some time to discussing the conventions that underlie use of the viewpoints. We also consider situation type, and viewpoint constraints on infinitives and negative sentences.

10.1.2 Morphological preliminaries

The Russian verb gives information about both situation type and viewpoint. The verb consists of a lexical stem with grammatical inflections. Prefixes, and two suffixes, contribute to the aspectual value of a sentence: they affect situation type and determine viewpoint. There are other, derivational, suffixes which form verb stems from lexical roots. Verbs are inflected for tense, mood, number, person, and gender. Various phonological processes affect affixes and inflections, e.g. truncation, consonant mutation, and vowel alternation, ignored here. (1) analyzes the hierarchical structure of the surface verb form:

(1) $_{\text{Verb form}}[_{\text{Stem}}[[\text{Prefix [Root] Suffix}]\ [\text{Inflection}]]$

The three parts of a stem—prefix, root, suffix—affect situation type and viewpoint. (2) presents a sentence and the analyzed verb form.

(2) a. Ona povytolkala meški.
She threw out$^{\text{Perf}}$ the bags one after another. (Accomplishment)

b. po-vy-tolk-a-l-a
1 2 3 4 5 6

c. $[[\text{pref-pref-root-sfx}]_{\text{Stem}}\text{infl-infl}]]_{\text{Verb form}}$

d. distrib-out$^{\text{Perf}}$-throw-stem-fem-sg

The prefix *vy-* expresses the perfective viewpoint and contributes to the situation type of the sentence. Stems with two prefixes are rare, and are restricted to a few of the approximately eighteen Russian prefixes.

Viewpoint is expressed by the verb stem. The stem may be simple and unprefixed, or complex. Typically the simple verb stem conveys the imperfective viewpoint.[3] Perfective stems are formed by the addition of a prefix. The new stem may differ in lexical meaning from the original stem, according to the particular prefix-stem combination. (3) gives a simple stem and two prefixes with which it may combine:

(3) pis-a-t' — to write$^{\text{Impf}}$
na-pis-a-t' — to write$^{\text{Perf}}$
pere-pis-a-t' — to write over, copy$^{\text{Perf}}$

The prefixes make the stems perfective; *na-* does not affect lexical meaning, while *pere-* changes it. Perfective and imperfective verb forms with the same lexical meaning are known as 'paired' forms.[4] Lexical prefixes are discussed in section 10.3.2 below.

Derived imperfectives can often be formed from perfective stems such as those in (3b) and (3c). Not every prefix with lexical content permits a derived imperfective, but typically they do, with the imperfective suffix-*(yv)aj-*. (4) presents the derived imperfective form which corresponds to (3c):

(4) pere-pis-yva-t'
to write over, copy$^{\text{Impf}}$

There are some unprefixed exceptional stems which convey the perfective viewpoint. These exceptional stems have derived imperfective verb forms, using the same imperfective suffix. (5) illustrates; the shape of the suffix is obscured by other factors.

(5) a. prostit' — to forgive$^{\text{Perf}}$
proščat' — to forgive$^{\text{Impf}}$

b. priobresti — to acquire$^{\text{Perf}}$
priobretat' — to acquire$^{\text{Impf}}$

Derived imperfectives are usually available for verb stems which have prefixes with lexical meaning. Prefixes with minimal lexical content are known as 'empty prefixes' in the literature. Stems with empty prefixes tend to have a simple imperfective form, not a derived one.

There is another aspectual suffix in Russian, the semelfactive suffix *-nu-* which at once indicates the Semelfactive situation type and forms a perfective verb stem. For instance, associated with the unprefixed verb stem in (5a) is a stem with the Semelfactive and perfective features, derived with this suffix:[5]

(6) a. kol-o-t' — to stab$^{\text{Impf}}$
b. kol'-nu-t' — to stab$^{\text{Perf}}$

Verbs with the feature Semelfactive have no imperfective form. The verb stem in (6a) underlies a multiple-event Activity (section 10.3.4). For full discussion of Russian verb forms, see the sources of note 1.

10.2 Viewpoint aspect

In this section we discuss the semantic meanings of the two viewpoints of Russian, and the conventions that underlie their use. The perfective is expressed by prefixed stems

and the suffix *-nu-*; the imperfective is expressed by unprefixed stems and the imperfective suffix *-(yv)aj-*. We concentrate on finite affirmative verbs; the viewpoints in infinitives and under negation are discussed in 10.4.3 and 10.4.5 respectively.

10.2.1 The perfective viewpoint

The perfective viewpoint in Russian presents dynamic situations with both initial and final endpoints. There are no perfective Statives. The Russian perfective has an unusual requirement of specificity: the bounds of an event must be specific unless they are intrinsic to the event. Sentences with the perfective viewpoint are illustrated in (7).

(7) a. On posidel v parke.
He sat for a while[Perf] in the park. (Activity)

b. On napisal pis'mo.
He wrote[Perf] a letter. (Accomplishment)

c. On stuknul v okno.
He knocked[Perf] at the window. (Semelfactive)

d. Vanja vyigral matč
Vanja won[Perf] the game. (Achievement)

Telic and single-stage events are intrinsically bounded, but Activities are not. The prefix of (7a) states a bound for the Activity.

For the perfective viewpoint Activity verb constellations require one of two special prefixes, *pro-* and *po-*. *Pro-* conveys limited duration; *po-* conveys a shorter duration than expected. They usually specify an independent bound with adverbials, as in (8):

(8) a. Ona pro-stoja-l-a na ugle celyj čas.
She pro-stand-PAST-Agr on corner-prep entire-acc hour-acc.
She stood[Perf] on the corner for an entire hour.

b. On po-rabota-l (časok).
He po-work-past (hour-acc-dim).
He worked[Perf] a bit (for an hour).

Since Activities must have one of these prefixes, the perfective is always associated with either an intrinsic or an independent bound.

The perfective viewpoint makes visible the endpoints of an event. We demonstrate this first for the initial endpoint. Consider a perfective clause in the context of a *when*-clause. The events must be sequential:

(9) a. Kogda on vyšel iz komnaty, on posidel v parke.
When he went out of the room, he sat for a while[Perf] in the park.

b. Kogda on vyšel iz komnaty, Vanja vyigral matč.
When he went out of the room, Vanja won[Perf] the game.

The sequential interpretation shows that the initial endpoint of the main clause event is included in the assertion, since that point is linked to the time of the *when*-clause. If the initial endpoint were not visible, the matrix clause situations in (9) might be already underway at the time of the adverbial clause event.

Now consider the final endpoint. We ask whether a perfective sentence allows an assertion that the event continues. Such an assertion would be possible if the final endpoint were not visible. (10) illustrates:

(10) a. #On posidel v parke, i ešče tam sidit.
He sat for a while[Perf] in the park, and is still sitting[Impf] there.

b. #On napisal pis'mo i ešče pišet ego.
He wrote[Perf] the letter and is still writing[Impf] it.

c. #On stuknul v okno, i ešče stučit v nego.
He knocked[Perf] on the window and is still knocking[Impf] on it.

d. #On vyigral matč, i ešče vyigryvaet ego.
He won[Perf] the game and is still winning[Impf] it.

These sentences are contradictory on the intended reading, in which both conjuncts denote the same event. They demonstrate that the perfective viewpoint makes visible the final endpoint of an event.

The perfective viewpoint in Russian is available to events. To account for this fact formally, the viewpoint is defined to apply to situations with endpoints. Since the requirement of specificity is encoded in the forms of the language, it is not part of the temporal schema. The Russian perfective thus conforms to the schema of Universal Grammar given in Chapter 4.

10.2.2 The imperfective viewpoint

The imperfective viewpoint in Russian focuses part of a situation, with neither initial and final endpoints. The Imperfective is available for all situation types and is therefore the dominant viewpoint in the language. (11) illustrates sentences with the imperfective viewpoint:

(11) a. Vanja golodal.
Vanja was starving[Impf]. (Stative)

b. Vanja pel v parke.
Vanja was singing[Impf] in the park. (Activity)

c. My pisali pis'mo.
We were writing[Impf] a letter. (Accomplishment)

d. On stučal v okno.
He was knocking[Impf] at the window. (Semelfactive)

e. On umiral.
He was dying[Impf]. (Achievement)

The interpretation of (11d) is derived, although the verb constellation is semelfactive; see the comments on the examples of (15).

We now demonstrate that the imperfective viewpoint of Russian makes visible neither endpoint of a situation. Consider the possible interpretations of an imperfective main clause with a *when*-clause adverbial. The situation must be already under way, if the initial endpoint is not visible. In contrast, an inceptive interpretation will be possible if the initial endpoint is visible. But only the ongoing interpretation is possible for such main clauses, as (12) illustrates:

(12) a. Vanja golodal, kogda žena uexala.
Vanja was starving[Impf] when his wife left. (Stative)

b. Vanja pel v parke, kogda Nina pojavilas.
Vanja was singing[Impf] in the park when Nina appeared. (Activity)

c. My pisali pis'mo, kogda on pozvonil.
We were writing[Impf] a letter when he called. (Accomplishment)

We must also show that the final endpoint of an imperfectively presented event is not semantically visible. We do this by conjoining an imperfective clause with an assertion that the event continues. The conjunction should not be contradictory, if we are correct about the semantic meaning of the imperfective. For instance:

(13) a. Vanja ostavalsja v Leningrade, i ešče tam ostaetsja.
Vanja was remaining[Impf] in Leningrad, and still remains there. (Stative)

b. Vanja pel v parke, i ešče tam poet.
Vanja was singing[Impf] in the park and is still singing there. (Activity)

c. My pisali pis'mo, i ešče pišem ego.
We were writing[Impf] a letter, and are still writing it. (Accomplishment)

As predicted, these conjunctions are entirely reasonable. With the *when*-clause and conjunction we have demonstrated that neither endpoint of an imperfectively presented situation is semantically visible.

Although the Achievement situation type is instantaneous, it allows the imperfective viewpoint. Achievement imperfectives focus the preliminary stages of an event; they give no information as to whether the event actually takes place. (14) illustrates, with continuations asserting that the events did not necessarily occur.

(14) a. On umiral, kogda vrač prišel.
He was dying[Impf] when the doctor arrived.

b. On umiral, i ešče umiraet.
He was dying[Impf], and is still dying.

c. On pridumyval, a ničego ne pridumal.
He was (trying to) think[Impf] of something, but didn't think[Perf] of anything.

We account for sentences like this by including preliminary stages in the temporal schema of certain Achievements.[7] Except for Chinese, the other languages of this study also allow preliminary focus.

The Semelfactive situation type, however, is semantically incompatible with the imperfective viewpoint. The events are instantaneous, without preliminaries, so they have no interval which the viewpoint could focus. There are no imperfective Semelfactive sentences. When semelfactive verb constellations occur with the imperfective, a derived Activity interpretation is triggered by the incompatibility between situation type and viewpoint (see Chapter 3).

(15) a. On stučal v okno, kogda ja vyšel.
He was knocking[Impf] at the window when I went out.

b. On stučal v okno, i ešče v nego stučit.
He was knocking[Impf] at the window and is still knocking at it.

The sentences present ongoing multiple-event Activities, without visible endpoints. (15a) does not admit an inceptive interpretation, which indicates that the initial endpoint is invisible; (15b) is coherent, which is only possible if the final endpoint is invisible as well.

The imperfective viewpoint of Russian does not focus resultant intervals, even when they are lexically included in the verb constellation. Consider (16). If the language had a resultative imperfective, we would expect the interpretation that Vanja is currently in a sitting position:

(16) Vanja sadilsja.
Vanja was sitting down[Impf].

But this sentence can only mean that Vanja was assuming a sitting position. To

express the resulting situation one uses a different lexical item, *Vanja sidel* (Vanja was sitting[Impf]).

Habitual sentences are derived Statives in situation type. Like basic-level states they require the imperfective viewpoint.[8]

(17) a. Ja rad,—skazal on prosto, kak govoril vse i vsegda.
"I am happy", he said[Perf] simply, as he said[Impf] everything and always.

b. Obyčno on prixodil na rabotu za pjat' minut do načala.
Normally he arrived[Impf] at work five minutes early.

c. On čitaet sovetskie romany po-russki.
He reads[Impf] Soviet novels in Russian.

The temporal schema for the imperfective viewpoint in Russian is a parametric variant of the Universal Grammar Imperfective. Russian has preliminary focus, but not resultant focus. *F* denotes the final endpoint of a situation, *E* denotes a single stage event.

(18) Schema for the Russian imperfective viewpoint
. . . . *F/E*
////

The viewpoint precedes the endpoint, excluding resultative focus. Since the temporal schema of a Semelfactive does not include a preliminary interval, this schema does not apply to Semelfactives.

10.2.3 Conventions of use

Speakers do not always use the perfective viewpoint for situations that are temporally closed; nor do they always use the imperfective for situations that are temporally open. The imperfective viewpoint is often chosen when a Russian speaker talks about a closed event, especially one whose final endpoint is known, as in (19):

(19) Zimnij dvorec stroil Rastrelli.
Rastrelli built[Impf] the Winter Palace.

This use of the imperfective does not mislead the receiver into concluding that Rastrelli did not complete the palace or that the speaker is describing the action in progress. Rather, (19) emphasizes the fact that the event took place. If the perfective viewpoint were used the focus would be on the completion of the event. We explain this and other interpretations with pragmatic conventions of use.

The imperfective viewpoint is dominant in Russian, systematically and conventionally. It is often used, quite neutrally, for closed situations which would warrant the perfective viewpoint. In contrast, the perfective viewpoint is marked, and conveys a particular emphasis. Russian grammarians have discussed and documented the uses of the aspectual viewpoints. We discuss below several traditional conventions for

their use, and the patterns of understanding that they represent. We will show that our approach can account for these patterns in an interesting way, without compromising the relatively simple semantic analysis of the two-component theory. The conventions of use are an essential complement to that analysis.

We distinguish direct and augmented interpretations. The direct interpretation of a viewpoint uses visible information about the temporal schema of a situation. The information is not cancelable, since it is conveyed by the linguistic forms of a sentence. The augmented interpretation has additional information which is due to inference, and can be overridden by other information.

The pragmatic emphasis of a convention may be positive, emphasizing visible information. The emphasis may also be negative; the negative emphasis implicitly draws on information which is excluded by a viewpoint. In our analysis the concept of pragmatic emphasis accounts for the contrastive force of the subordinative oppositions which are assumed by the Prague School approach.

The perfective viewpoint

Direct interpretation: In its primary conventional meaning, the Russian perfective viewpoint emphasizes the final endpoint of the situation. We call this the 'Final Emphasis' force of the perfective. It gives positive pragmatic emphasis to the direct meaning of the viewpoint. If speakers do not wish to convey this, they use the imperfective viewpoint.

The perfective conveys that a telic event has proceeded to its natural final endpoint (20), and that an atelic event has terminated (21).

(20) a. On vstal ran'še vsex.
He got up[Perf] before everybody else. (Accomplishment)

b. Ona prišla na rabotu za pjat' minut do načala.
She came[Perf] to work five minutes early. (Achievement)

(21) a. On stuknul v okno.
He knocked[Perf] at the window. (Semelfactive)

b. On mne pomog vo vremja moej učeby.
He helped[Perf] me during my studies. (Activity)

There is a family of adverbials which "emphasize the performance of the action as a total event" (Forsyth 1970:64), illustrated in (22):

(22) a. More soveršenno uspokoilos'.
The sea had calmed down[Perf] completely.

b. Avilov...srazu zasnul krepkim zdorovym snom.
Avilov...immediately fell[Perf] into a sound, healthy slumber.

These adverbials invite the Final Emphasis convention.

Augmented interpretation: There are several conventions, some of them conflicting, for augmentation of perfective sentences. Context and world knowledge usually determine the appropriate interpretation.

The perfective viewpoint in a sentence may suggest that the state resulting from a completed telic event continues. This is the convention of 'Continuing Result,' as in (23):

(23) K vam kto-to prišel.
Someone has come[Perf] for you (and is still here).

By the Continuing Result convention, we understand that the result of the event still obtains. This convention is not always available. It is blocked in narrative contexts where events directly follow one another.

Narrative contexts have their own conventions. Primary among them is the convention of 'Sequentiality.' Perfective sentences advance a narrative by presenting events in a sequence. The events are related in a chain-like fashion: the final endpoint of one event is followed by the initial endpoint of the next. For example:

(24) a. On vošel, otkryl okno, i vyšel.
He entered[Perf], opened[Perf] the window, and went[Perf] out.

b. On prostojal na uglu časok i sel v avtobus.
He waited[Perf] on the corner for an hour and got[Perf] on a bus.

c. Včera prišel ‹počtal'on'. On posidel, popil s nami čaj, i ušel.
Yesterday the postman came[Perf]. He sat[Perf] for a while, drank[Perf] some tea with us, and then left[Perf].

This use of the perfective emphasizes each event as a complete whole. The sequential interpretation is compatible with the Final Emphasis force of the perfective viewpoint, since the emphasis given to the final endpoint makes it a natural anchor for a subsequent event.

The sequential interpretation can be ruled out, however, by other information in the context, as (25) illustrates:

(25) On odnovremenno napisal pis'mo i proslušal kassetu.
He simultaneously wrote[Perf] a letter and listened[Perf] to a cassette.

In this example, simultaneity is explicitly stated.

The perfective viewpoint may license the inference that an event was supposed to take place, by the convention of 'Intention.' The notion of intentionality and volition do not involve strictly temporal properties; however, they are often discussed in connection with viewpoints. Consider the examples of (26), from Rassudova (1982:44):

(26) a. Vy pozvonili/zvonili svoemu naučnomu rukovoditelju?
Did you call[Perf/Impf] your academic advisor?

b. Nakonec ty peredal/peredaval emu moju pros'bu.
You finally conveyed[Perf/Impf] my request to him.

The viewpoints contrast in these sentences. The perfective emphasizes endpoints, and allows the inference that the event was intended to occur. The imperfective viewpoint has no such inference.

The imperfective viewpoint

Direct interpretation: The imperfective viewpoint focuses the visible portion of a situation; this is the basic 'Ongoing' emphasis of the imperfective. The event presented imperfectively often overlaps with, or frames, another event, not necessarily mentioned:

(27) a. Okna vyxodjat na ulicu.
The windows looked out[Impf] onto the street. (Stative)

b. Čto on delal? On guljal v parke.
What was he doing? He was strolling[Impf] in the park. (Activity)

c. Kogda ja vošel, on slušal radio i gotovil zavtrak.
When I entered, he was listening[Impf] to the radio and preparing[Impf] breakfast. (Accomplishment)

The time framed may be Speech Time, or identified explicitly as another time. This use of the imperfective is common in language (Chapter 5).

The situation may also span an interval specified by an adverbial; this is a pragmatically positive use:

(28) a. On vsju molodost' bojalsja otca.
All his life he feared[Impf] his father. (State)

b. On stojal na uglu ot dvux do pjati.
He stood[Impf] on the corner from two to five. (Activity)

What is emphasized in these sentences is the ongoing event or state.

In narratives the imperfective viewpoint often gives backgrounded information (see the discussion in Chapter 4). The backgrounding interpretation is associated with the convention of 'Simultaneity', which has positive pragmatic force. Like other conventions it can be overridden by additional information, as in this example:

(29) On gotovil zavtrak i potom pisal domašnjuju rabotu.
He was cooking[Impf] breakfast and then did[Impf] his homework.

Here the explicit statement of sequence in the form of the adverb *potom* (then) determines the interpretation.

The pragmatic force of the imperfective is negative when it emphasizes that end-

points are absent. The convention is one of 'Incompleteness'. Imperfectives with negative force invite the inference that the natural endpoint was not reached. This negative pragmatic force is found with Accomplishments and Achievements, as in (30):[8]

(30) a. On pisal pis'mo, a ne napisal ego.
He was writing[Impf] the letter, but did not write[Perf] (finish) it.

b. On tonul, no ego spasli.
He was drowning[Impf], but (they) saved[Perf] him.

c. Oni ne ugovorili ee ujti s nimi, xotja dolgo ugovarivali.
They did not convince[Perf] her to leave with them, although they (tried to) convince[Impf] (her) for a long time.

Information in the context may block the convention of Incompleteness: In (31) we are explicitly told that the final point was reached.

(31) Dolgo ee ugovarivali ujti s nimi, i nakonec-to ee ugovorili.
They (tried to) convince[Impf] her for a long time to leave with them, and finally convinced[Perf] her.

The negative force of the imperfective can be explained by the Gricean maxim of quantity: say as much as is required for understanding. Since the imperfective viewpoint does not make endpoints visible, the receiver infers that this focus is not warranted.

Augmented interpretations: The imperfective viewpoint may present a situation that is known to be closed. This use is common in Russian; we know of three conventions for such presentation, 'Annulled Result,' 'Discontinuity,' and 'Statement of Fact.'

The convention of Annulled Result suggests that the final point of a situation was reached, but subsequently annulled, as in (32):

(32) K vam kto-to prixodil.
Someone has come[Impf] for you (and is no longer here).

We understand that the visitor has arrived and left by the time of the utterance. This use of the imperfective requires inferences about two events: the event presented, and a subsequent closed event which reverses its effect. (33) gives other typical examples:

(33) a. Ja otkryval okno.
I opened[Impf] the window.

b. On prosypalsja, a potom opjat' zasnul.
He awoke[Impf] and then fell asleep again.

c. Kto vybegal iz doma?
Who ran out[Impf] of the house?

(33a) might be uttered when the speaker and a friend have within view a closed window which had been opened earlier. The perfective in this context would be inappropriate, because it would suggest that the window was open at the time of speech.

The convention of Annulled Result is commonly invoked with verb constellations referring to motions or paths that are reversible, such as coming and going, open and closing. The paths may be metaphorical, as in falling asleep and awakening. The reversal frequently involves a return to a state of affairs that is natural or basic: a person returning home, water freezing and then melting to become water again.

The imperfective may suggest a break in time after a closed situation: this is the convention of 'Discontinuity'. One infers the final endpoint of the situation and a subsequent interval before the time of a sentence. Rassudova (1982:46-7) provides the example of (34):

(34) Ja uže zapolnjal anketu. Začem ešče raz?
I already filled out[Impf] the questionnaire. Why again?

Contrast this sentence with (35), which lends itself to the convention of Continuing Result:

(35) Ja uže zapolnjal anketu. Ona naxoditsja u dežurnogo.
I have already filled out[Perf] the questionnaire. The receptionist has it.

This contrast is parallel to that between the perfective of Continuing Result and the imperfective of Annulled Result. Without the notion of a reversible path the contrast is less stark, and is available for a broader range of verbs, including those of created objects.

One also infers closure with the 'Statement of Fact' convention, a traditional term (*konstatacija fakta*). By this convention the receiver infers the final endpoint of a situation from an imperfective presentation. Often the receiver knows that the final endpoint has occurred; thus in example (19) above it is common knowledge that Rastrelli finished building the Winter Palace. In some case the Statement of Fact convention leads to inference of a final endpoint, as in (36):

(36) a. Ja govoril emu ob ètom.
I told[Impf] him about this.

b. Sobiralis' predstaviteli obščestvennosti v ètot den?
Did the members of society meet[Impf] on that day?

c. Vy kogda-nibud' opazdyvali v teatr?
Have you ever been late[Impf] to the theater?

d. Ty uznaval, kogda my uezžaem?
Did you find out[Impf] when we were leaving?

(36a) conveys that the conversation successfully took place. In (36b-d), all Achieve-

ments, the receiver augments the information conveyed by inferring that the event occurred (Rassudova 1982, Glovinskaja 1981, Svedova, 1980, 1984).

Though the Statement of Fact convention is most striking for telic situation types, it is also used with Statives and Activities:

(37) a. Nataša žila v Leningrade.
Natasha lived[Impf] in Leningrad.

b. Vy iskali komendanta? (Glovinskaja 1981)
Have you looked for[Impf] the commander?

The examples in (36-37) denote indefinite situations that are not clearly anchored to a time. In fact, the indefinite situation is a thread that runs through the entire web of Statement of Fact usage. The convention is often invoked by indefinite situations, such as those of interrogatives and negatives, which tend to emphasize the occurrence of a situation. This understanding is similar to the experiential perfects of English and Mandarin, for which there is no direct counterpart in Russian.

The Statement of Fact convention can be overridden by other information. For instance, a momentary adverb makes an event specific. (38a) presents an indefinite situation and is a straightforward case of Statement of Fact; but (38b) has a definite time adverbial and can only be understood to present a situation in progress:

(38) a. Vy čitali zapisku?
Have you read[Impf] the note?

b. V tri časa, kogda vošel v komnatu, on čital zapisku.
At three o'clock when I entered the room, he was reading[Impf] the note.

The momentary adverbial directs pragmatic emphasis at the situation itself, blocking the indefinite Statement of Fact interpretation.

When an indefinite situation pertains directly to the present, however, people use the perfective viewpoint rather than the imperfective. If a neighbor is fumbling at the lock of his apartment, trying to get in, one would say: *Vy poterjali ključ* (Have you lost[Perf] your key?) By the convention of Continuing Result, this suggests that the key, if lost at all, is still lost. The imperfective would be odd in this context, suggesting a question about whether the neighbor had ever lost his key. Here the perfective of Continuing Result overrides the imperfective of Statement of Fact.

The Statement of Fact convention, like those of Annulled Result and Discontinuity, is positive pragmatically: all three emphasize information which is made visible by the viewpoint. They contrast with the perfective, which by the Final Emphasis convention pragmatically emphasizes the final endpoint of an event. When there is no need for such emphasis the imperfective is more appropriate.

Aspectual competition: This term is traditionally used to describe cases when both viewpoints are conventionally available to the speaker. The contrasts are extremely

subtle, if identifiable at all. In the following examples either viewpoint is possible (Rassudova 1977:30):

(39) a. Vtoroj i poslednij den' soveščanija prošel/proxodil bolee šinno.
On the second and final day the meeting proceeded[Perf/Impf] more decorously.

b. God nazad on sobstvennoručno vručil/vručal ej "Znak početa."
A year ago he personally awarded[Perf/Impf] her a "Citation of Honor."

There is a slight difference of pragmatic emphasis. With the perfective viewpoint the pragmatic emphasis is on endpoints; with the imperfective the emphasis is on the occurrence of the situation.

In this discussion we have used conventions of use to supplement semantic information. The result is a consistent account of viewpoint interpretation for a set of well-known cases. We have not been able to deal with all the cases, of course. This brief sketch shows that the semantic and pragmatic analysis we propose has explanatory value for the understanding of the viewpoint aspects of Russian.

10.3 Situation Aspect

10.3.1 Grammatical features of Russian

Nominals: Russian has no articles; nounphrases (NP) may be interpreted as specific, nonspecific, or generic in reference. Certain syntactic contexts are determinate, while other contexts allow more than one nominal interpretation. The perfective viewpoint requires specific reference; the imperfective does not. Thus in (40a) the object NP is specific; in (40b) the object may be specific, nonspecific, or generic.

(40) a. Ja s' el mjaso.
I ate[Perf] the meat.

b. Ja el mjaso.
I ate[Impf] the meat/meat.

Russian has a rich case system, but case does not clearly pattern with specificity. The accusative case generally involves specificity whereas the genitive is indeterminate. The partitive may have specific or nonspecific reference (Chvany (1983). Russian has demonstratives, possessives, and other noun modifiers of specific reference. In what follows we simply note when a specific NP is required.

Verb stems: Most simplex stems have the imperfective viewpoint (see 10.1.2), but some are perfective. The simplex imperfective stems appear in all situation types while simplex perfectives are only available for telic situations. (41) illustrates stems of both types.

(41)

Imperfective stems	Perfective stems
videt' (to see)—State	lisit' (to deprive)—Accomp.
guljat' (to stroll)—Activity	dat' (to give)—Achieve.
čitat' (to read)—Accomp.	
terjat' (to lose)—Achieve.	

Prefixes and suffixes may be added to verb stems with varying degrees of productivity. The results are new stems which differ in lexical meaning, sometimes in situation type.

Prefixation: Adding a prefix to a stem results in a perfective verb. This is a general principle of Russian morphology which has no exceptions. Certain prefixes primarily convey the perfective viewpoint, whereas others have lexical meaning as well. The latter are known as lexical prefixes. They affect the lexical meaning of a verb, and may change situation type, in addition to creating a perfective verb stem. (42) illustrates for *pisat'*, which has the intrinsic feature [Activity].

(42) a.	do-pisat' (to add in writing)	Activity
b.	is-pisat' (to cover with writing)	Accomplishment
c.	na-pisat' (to write onto)	Activity
d.	nad-pisat' (to write above)	Activity
e.	o-pisat' (to prepare an inventory)	Accomplishment
f.	vy-pisat'-sja (to write oneself out)	Accomplishment

In certain cases, recursive prefixation is possible, e.g., *po-na-vy-dergivat' markovki* (to pull out, one by one, a large number of carrots over a limited period of time).

Super-lexical morphemes are prefixal in Russian. Super-lexical morphemes present a narrow focus of a situation, usually on the endpoints or middle (see Chapters 2, 3). In the Slavic literature this class is called 'Aktionsart', 'sublexical', 'mode of action', 'procedural'. (43) shows the simple verb *pisat'* with three super-lexical prefixes.

(43) a. do-pisat' (to finish writing)
b. za-pisat' (to begin writing)
c. po-pisat' (to write for a while)

(43a-b) are Accomplishments verbs, (43c) an Activity verb. This is only a partial list of super-lexical prefixes in Russian.

10.3.2 Temporal properties in Russian

We summarize here the syntactic properties of Russian which express the temporal features of the situation types. They characterize the situation types, and can be used to develop tests for situation type.

Dynamism: Agency is often a component of dynamism, and the following agentive contexts require event verb constellations: subject agency adverbials like *ostorožno*

(carefully) and *vnimatel'no* (attentively), imperatives, instrumentals, embedding verbs such as *zastavit'* (to force) or *ugovorit'* (to convince).

The perfective viewpoint is available only for events. Certain verbs require event complements, e.g., the verbs *proisxodit'/proizojti* (to happen), *delat'/sdelat'* (to do). Questions based on these verbs can be asked only for events: *čto proizošlo/proisxodit* What happened[Perf]/is happening[Impf]?); *čto on sdelal/delal* What did he do[Perf/Impf]?) The predication *byt' zanjat tem, čto. . . .* (to be engaged in) requires event complements. This cluster of properties constitutes dynamic syntax.

Duration: Durative adverbials take several forms: lexical adverbs, e.g. *dolgo* (for a long time); bare accusative noun phrases, e.g. *vsju nedelju* (all week); prepositional phrases, e.g. *do zari* (until dawn), *ot dvux časov do pjati* (from two to five o'clock). Durative, imperfective complements are required for superlexical verbs such as *načat'* (to begin), *prodolžat* (to continue), and *perestat'* (to stop).

Completion: Completive adverbials and verbs require telic situations and the perfective viewpoint. Adverbials have the prepositions *za* or *v*, e.g. *On napisal pis'mo za minut* (He wrote[Perf] the letter in 15 minutes), On pročital roman za dva dnja (He read[Perf] the novel in 2 days). Completive verbs, e.g. *končit'* (to finish) must have telic situation types as complements. Certain manner adverbials imply completion, e.g. *postepenno* (gradually).

Non-Detachability: The relation of non-detachability, which holds for Accomplishments, can be demonstrated with an entailment from the perfective to the imperfective: *On pročital pis'mo* (He read[Perf] the letter) entails *On čital pis'mo* (He was reading[Impf] the letter). The adverb *počti* (almost) also demonstrates non-detachability in perfective Accomplishment sentences. They are ambiguous: the adverbial may denote either the initial or final endpoint of the event, e.g. *On počti otkryl okno* (He almost began to open it, or He almost got it open).

10.3.3 Activities.

Activity verb constellations present atelic, durative events:

(44) a. Miša guljal v parke.
Misha was strolling[Impf] in the park.

b. Tolpa šumit.
The crowd is making[Impf] a lot of noise.

c. Deti eli jabloki.
The children were eating[Impf] apples.

Simple, unprefixed verb forms in Activity constellations have the imperfective viewpoint. There are two special prefixes which produce perfective verb stems from these

forms. They provide independent bounds for atelic situations, thus conforming to the specificity requirement of the Russian perfective viewpoint.

The 'perdurative' prefix *pro-* indicates limited duration, and appears with a time expression in the accusative case. The 'delimitative' prefix *po-* indicates a shorter period than expected; this prefix need not combine with a time expression, but it may, as in (45b):

(45) a. Ona prostojala na uglu celyj čas.
She stood[Perf] on the corner for an entire hour.

b. On porabotal (časok).
He worked[Perf] a bit (for an hour).

Both of these prefixes result in perfective verbs; the verbs in these examples are derived from the imperfective verbs *stojat'* (to stand) and *rabotat'* (to work), respectively.

The prefixes close a situation so that it has both initial and final endpoints; the final endpoint is arbitrary, as is typical of atelic events. Explicit boundedness does not entail that an event is telic in the strict sense. As Flier puts it, "It is impossible to reconcile delimitation with any sort of net change or result" (1984:45). When independent, explicit bounds are given by the adverbial, as in (45a), perfective Activity sentences are telic in the general sense; see 10.3.4, and Chapter 3.

Certain Activity verb forms convey the perfective viewpoint without prefixes. (46) demonstrates:

(46) a. pomogat': pomoč' (to help[Impf/Perf])
Oni osobenno nam pomogli vo vremja Olimpijskix igr.
They especially helped[Perf] us during the Olympic games.

b. igrat': sygrat' (to play[Impf/Perf])
Sovetskaja komanda sygrala (ètot matč) xorošo.
The Soviet team played (this game) well.

c. starat'sja : postarat'sja (to try[Impf/Perf])
On očen' postaralsja.
He tried[Perf] very hard.

Verb constellation patterns

a. Verbs with the intrinsic feature [Atelic] form Activity constellations with an NP complement, e.g. *Petja taščit kartošku* (Pete is dragging potatoes); with a Locative complement, *Vanja guljal v parke* (Vanja strolled around in the park); or with no complement at all, *Rebenok šumit* (The child is making noise).

b. Verbs with the intrinsic feature [Telic] form Activity constellations with mass nouns and bare plurals. Such NPs denote uncountables. The events are indefinite: Nataša p'et vino (Natasha is drinking wine), *Lev pišet dlinnye romany* (Leo writes long novels).

c. Verbs of position appear as Activities, with salient agents: *deduška sidit v parke* (Grandfather is sitting in the park). Such verbs appear in Stative verb constellations with inanimate subjects: *pamjatnik stoit na tom uglu* (The monument stands on that corner over there).

d. Derived, Multiple-event Activities consist of repeated sub-events, denoted by the basic-level verb constellation. The sub-events vary in situation type: they may be Accomplishments *Koleso krutitsja* (The wheel is spinning), Semelfactives *Kto-to stučit v dver* (Someone is knocking at the door) or Achievements *On vyigryval v šaxmaty vsju nedelju* (He was winning at chess all week). Such sentences are generally known as Iteratives in the Slavic literature.

Syntactic features

a. Activities have dynamic syntax.
b. They are compatible with expressions of simple duration.
c. They are incompatible with expressions of completion.

10.3.4 Accomplishments

Accomplishments are durative telic events. Examples include:

(46) a. Karl vstal
Carl arose[Perf].

b. Lev napisal roman.
Leo wrote[Perf] a novel.

c. Rebenok s' el jabloko.
The child ate[Perf] an apple.

d. Kolja poexal v Moskvu.
Nick went[Perf] to Moscow.

Accomplishments are specific, countable events. The specificity of a nominals may be indicated by accusative case direct objects instead of genitive; and by demonstratives or quantifiers. A vague nominal is taken as specific in the context of an Accomplishment verb constellation.

Perfective Activity sentences with explicit, independent bounds are a special type of derived Accomplishment. Like Accomplishments, they are ambiguous with *pochti* (almost):

(47) Ona pochti prostojala na uglu celyj čas.
She almost stood on the corner for an entire hour.

This sentence means either that she almost started to stand on the corner, or that she almost stood for an entire hour. Completive adverbials, which pattern with Accom-

plishments, do not appear with perfective Activity sentences for other reasons.[9] All bounded events are semantically telic (see chapters 2, 3).

If a perfective Accomplishment sentence is true at an interval, the truth of the corresponding imperfective follows as an entailment.

Verb constellation patterns
a. Verbs with the intrinsic features [Telic] and [Durative] appear in Accomplishment constellations with their arguments. Such constellations may be transitive, *Gorod postroil park* (The city built a park) or intransitive, *My vstali* (We stood up).
b. Accomplishments may consist of a finite number of repetitions of an event, indicated with a cardinal or other adverbial. The final endpoint of the last subevent is the final endpoint of the event: *On povtoril ètot zvuk tri raza* (He repeated[Perf/Impf] this sound three times).
c. Most Accomplishment verbs occur in aspectual pairs, formed by prefixation or suffixation.

Syntactic features
a. Accomplishments have dynamic syntax.
b. They are incompatible with expressions of simple duration.
c. They are compatible with expressions of completion.
d. They are ambiguous with *počti* (almost).

10.3.5 Semelfactives

Semelfactives are instantaneous, single-state events consisting of a single point, with no associated change of state. Examples include:

(48) a. Igor' stuknul v dver'.
Igor knocked[Perf] at the door.

b. Professor kašljanul.
The professor coughed[Perf].

c. Vdali kto-to maxnul rukoj.
In the distance somebody waved[Perf] his hand.

Semelfactives are always perfective: the situation type is incompatible with the imperfective viewpoint. Sentences with a semelfactive verb constellation and the imperfective viewpoint have shifted interpretations, as multiple-event Activities or habitual Statives.

Semelfactives allow momentaneous adverbials.

Verb constellation patterns
Semelfactives may be transitive *bodnut'kolxoznika* (to butt a collective farmer), intransitive *kašljanut'* (to cough), or they may have an oblique complement *maxnut'rukoj* (to wave one's hand).

Syntactic features
a. Semelfactives have dynamic syntax.
b. They do not allow the imperfective viewpoint.
c. They are incompatible with expressions of completion.
d. They are incompatible with expressions of duration.

10.3.6 Achievements

Achievements are instantaneous, dynamic changes of state. They include causatives and inceptives; (49) illustrates:

(49) a. Ljuba dostigla veršiny.
Ljuba reached[Perf] the top.

b. P'janica razbil stakan.
The drunk shattered[Perf] the glass.

c. Staryj pes sdoxnul.
The old dog died[Perf].

Many Achievement events allow the imperfective viewpoint. The focus is on a preliminary interval, as in the main clause of (50):

(50) Otec umiral, kogda ja vernulsja.
Father was dying[Impf] when I returned[Perf].

Whether the event actually takes place is unknown in such cases.

There is often a volitional interpretation with imperfective Achievements. The preliminary focus suggests a conscious attempt by the agent. This is known as a 'conative' interpretation, "an attempt to perform the action which the perfective denotes" (Forsyth 1970:49). Translation brings out the volitional force of the conative reading. The contrast between a conative and a simple imperfective requires an additional lexical verb in English, as shown in (51b).

(51) a. ugovorit'n (to persuade[Perf] to do something)
b. ugovarivat' (to attempt to persuade[Impf] to do something)

The conative understanding is possible only with a certain class of verbs (Forsyth 1970: 49-51). In our terms, they are Achievements with preliminary stages. The conative interpretation follows from the negative pragmatic emphasis of the imperfective with an Achievement.

The imperfective viewpoint is available for many Achievements, but not all. Certain Achievement events do not really have preliminary stages, from a pragmatic point of view. They are odd with the imperfective viewpoint, e.g. *On naxodit ključ* (he is finding the key).

Certain basic-level Achievement verbs do not have an imperfective form; for oth-

ers, the imperfective form is blocked because it is reserved for Statives. With perception verbs and certain private predicates, for instance, verb constellations are both Achievements and Statives. The perfective viewpoint appears with Achievements; the imperfective appears in Stative constellations. Examples include *videt': uvidet'* (to see[Impf]: to catch sight of, spot[Perf]); *ponimat'/ponjat'* (to understand[Impf]: to come to understand[Perf]).

Achievements formed with super-lexical prefixes are idiosyncratic: some have imperfective forms and others do not. There are apparently no morphological or semantic principles that determine, for example, why *zalročat'* (begin shouting) does not have a derived imperfective **zakrikivat'*, while *dočitat'* (read to the end) does have one: *dočityvat'*.

Verb constellation patterns

a. Achievements are transitive or intransitive.
b. All Achievements have perfective verb forms. Some have an imperfective form, e.g. *umerat' : umeret'* (to die). Others have no imperfective forms, e.g. *ruxnut'* (to collapse).

Syntactic features

a. Achievements have dynamic syntax.
b. They are incompatible with expressions of simple duration.
c. They are compatible with expressions of completion, on an ingressive interpretation.

10.3.7 Statives

Stative constellations denote a property, relation, position, emotion, or existence. They have lexical verbs or copular constructions, as in (52).

(52) a. Vanja ljubit Mašu.
Vanya loves[Impf] Masha.

b. Istoričeskij muzej naxoditsja v Moskve.
The historical museum is[Impf] located near Moscow.

c. Petja znaet[Impf] otvet.
Petya knows the answer.

d. Ona byla umnaja.
She was[Impf] intelligent.

Statives include generic predications, which do not have a particular grammatical marker, as in (53):

(53) a. Čelovek obladaet mozgom.
Man has a brain.

b. Sportsmeny čitajut gazetu *Sovetskij sport.*
Atheletes read the newspaper *Soviet Sports.*

Stative sentences in Russian appear only in the imperfective viewpoint. This limitation is inherent in the morphology of the language: stative verbs have only imperfective forms. Apparent pairs, such as *videt': uvidet'* (see[Impf/Perf]) and *ponjat': ponimat'* (understand[Perf/Impf]) are not lexically or aspectually identical.The members of each pair belong to different situation types: the imperfectives are Stative, the perfective forms are inchoative Achievements.

Habituals are derived Statives. The verb constellation denotes the situations which are the recurrent situations. Habituals may be signalled by frequency adverbs or by the quantification of arguments. The sub-event may be of any situation type. (53) illustrates:

(53) a. Nataša často v ljubvi.
Natasha is often in love. (Stative)

b. Boris ešednevno guljaet v parke.
Boris strolls[Impf] in the park daily. (Activity)

c. Ja vse vremja terjaju ključi.
I lose[Impf] the keys all the time. (Achievement)

Sentences without a frequency adverbial may be indeterminate between a specific, basic-level and a derived habitual interpretation. Context or world knowledge often resolves the indeterminacy; see Chapters 3, 7.

Two morphemes are specific to habitual sentences. *Byvat'*, a form of the copula, is widely used with habitual meaning. For example, the sentence *Ja byvaju v Moskve* (I am in Moscow) is habitual: it means that the event occurs with a certain frequency. The sentence might be true at the same time that the basic-level stative *Ja v Moskve* (I am in Moscow) was false. The suffix *-(yv)aj-* is also habitual, appearing with an unprefixed imperfective verb form: *Ja u nix sžival celymi časami* (I would/used to sit at their place for hours). It suggests that a pattern is in the distant past, and no longer occurs. In Modern Russian, this suffix is not productive morphologically and is used only in the past tense.

There is an interesting syntactic context for habituals, with the habitual particle *byvalo*. The particle expresses the imperfective viewpoint, so that when it occurs the verb pertains to the sub-events rather than the habitual pattern. In (55), *byvalo* is imperfective and the perfective indicates that each of the sub-events is closed:

(55) On, byvalo, otkroet vam samyj složnyj zamok.
It would happen that he would open[Perf] the most complicated lock for you.

In effect, the particle *byvalo* allows the habitual sentence to be decomposed into two parts, habitual pattern and sub-events.

Verb constellation patterns
a. Verbs with the intrinsic feature [Stative] have varied structures. They are intransitive, *suščestvovat'* (exist'), transitive, *ljubit' čto-libo* (love something), and take sentential complement *dumat', čto* (think that . . .).
b. Prepositions affect situation type: *dumat', čto ty krasivyj* (to think that you are handsome) is Stative, while *dumat', o čem-libo* (to think about something) is an Activity.
c. Habituals are derived from all basic-level verb constellations.
In habitual Statives, Achievement verb constellations may have an imperfective viewpoint form: *dočit': dočitat'* (to read to the end).

Syntactic properties
a. Statives do not appear with dynamic syntax.
b. They require the imperfective viewpoint.
c. They are compatible with adverbials of duration, but not completion.

10.4 Temporal location in Russian

10.4.1 Tense

The Russian tense system is relatively simple, with two inflectional tenses, Past and Non-past. There are perfective and imperfective verb forms in both tenses, with different temporal meanings. Russian has no dedicated Perfect tense, though certain perfectives have the force of a Perfect (section 10.2.3). There is a periphrastic Future tense.

The temporal meaning of the past tense is independent of viewpoint. It consistently indicates anteriority, either to Speech Time or to Reference Time. But in the Non-past tense, the choice of viewpoint determines temporal meaning. The perfective viewpoint expresses Future time and the imperfective expresses Present time:

(56) a. On brosit kamni.
He will throw[Perf] stones.

b. On brosaet kamni.
He is throwing[Impf] stones.

The imperfective Non-past can be used as a historical past or Futurate; we do not discuss these possibilities here.

The periphrastic Future tense requires an imperfective verb form; it combines an exceptional form of *byt'* (to be) with an infinitive:

(57) On budet brosat'/*brosit kamni.
He will be throwing[Impf/*Perf] stones.

Thus the imperfective viewpoint may appear in Past, Present, and Future sentences; the perfective appears in Past and Future sentences.

Russian conforms to the general semantic restriction on sentences about the Present: situations in the Present must be open (Chapter 4). It is not possible to talk about Present situations as closed in Russian, because the only available Present viewpoint is imperfective.

There are no marked uses of the perfective viewpoint to telescope time as in the dramatic, sports announcer type of sentence (*Jones runs to third base*). The performative, another marked use, does appear:

(58) a. Ja obeščaju prijti zavtra.
I promise[Impf] to come[Perf] tomorrow.

b. Ja kljanus' otomstit'.
I swear[Impf] vengeance.

In these sentences time is telescoped to present a closed Present event.

10.4.2 Adverbials

Location adverbials refer to a point or an interval of time which need not be exhaustively filled by the situation. These adverbials appear with the perfective and imperfective viewpoints.

Durative adverbials designate an interval (possibly open-ended at one end) in which a situation holds. They appear as lexical adverbs *dolgo* (for a long time), bare accusative noun phrases *vsju nedelju* (all week), and prepositional phrases *do zari* (until dawn), *ot dvux časov do pjati* (from two to five o'clock). Durative adverbs are compatible with durative situations and the imperfective viewpoint, as in (59):

(59) On pisal/*napisal pis'mo materi dva časa.
He was writing[Impf]/*wrote[Perf] a letter to his mother for two hours.

Exceptionally, delimitative and perdurative verbs (with the prefixes *po-* and *pro-*) allow durative adverbials; see section 10.3.3.

Completive adverbs denote an interval. They convey that the final endpoint of a durative, telic event is reached at the end of that interval. They have the prepositions *za* or *v* and an accusative NP. Completives require the perfective viewpoint, except for habitual stative sentences:

(60) a. On napisal pis'mo v 15 minut.
He wrote[Perf] the letter in 15 minutes.

b. On pišet pis'ma načal'stvu za 15 minut.
He writes[Impf] letters to the administration in 15 minutes.

Completive adverbs are ingressive with Achievements: the event occurs at the end of the interval indicated by the adverb.

(61) On dostig veršiny za 15 minut.
He reached[Perf] the top in 15 minutes.

This outline is confined to basic-level cases. We do not discuss the shifted interpretation of sentences in which incompatible adverbials and verb constellations appear. In such cases the adverbial overrides, producing a derived situation type; see Chapters 3 and 5 for discussion.

10.4.3 Infinitives

Russian is unusual in that infinitive verb forms participate fully in the viewpoint system. Infinitive forms express viewpoint only; they do not convey tense or agreement. They appear in embedded complements and other contexts. The viewpoints of infinitives generally follow the principles of aspectual choice for the language. However, certain verbs are exceptional in requiring a certain viewpoint in an infinitive complement. There are also special conventions of use for infinitives.

We first present the straightforward cases, where the viewpoint of infinitives follows from general principles, and then consider some of the exceptions. The discussion is limited to verb constellations which are complements of finite verb constellations. We will often refer to them simply as infinitives (rather than infinitive verb constellations).

Straightforward cases
Infinitives may have the perfective and/or the imperfective viewpoint, like verb constellations generally. (62) presents infinitives with the perfective viewpoint. As usual, the perfective is available for events and presents a situation with initial and final endpoints.

(62) a. On ljubit poboltat'.
He likes to prattle[Perf] for a bit. (Activity)

b. On poprosil menja ob'jasnit' emu urok.
He asked[Perf] me to explain[Perf] the lesson to him. (Accomplishment)

c. Ja xoču poproščat'sja s vami
I want[Impf] to bid farewell[Perf] to you. (Achievement)

The imperfective is equally natural in infinitives. It appears with four of the situation types, presenting a situation without endpoints:

(63) a. Bylo prijatno slušat' dobrye slova.
It was pleasant to listen[Impf] to nice words. (Activity)

b. Zavtra mne nado pisat' recenziju.
Tomorrow I have to write[Impf] a review. (Accomplishment)

c. Moj tovariščʼ pomogal mne vybirat' lyži.
My comrade helped[Impf] me choose[Impf] skis. (Achievement)

d. Ja xoču byt' vysokim.
I want to be[Impf] tall. (Stative)

When the matrix verb involves an habitual action, its scope does not extend to the infinitive. The infinitive may therefore be perfective, as in the following sentences from Rassudova 1974:

(64) a. Mnogo raz sobiralsja provedat' vas.
Many times I was getting ready[Impf] to visit[Perf] you.

b. Syn vsegda staralsja vypolnit' vse pros'by otca.
The son always tried[Impf] to fulfill[Perf] all of his father's requests.

These examples document the fact that Russian offers a choice of viewpoint for infinitives. This feature is unique to Russian among the languages studied here.

Determining matrix verbs
The lexical properties of certain verbs override general principles. Implicative verbs, a small semantic class, require perfective infinitives as complements, as in (65):

(65) a. Mne udalos' dostat' bilet v Bol'šoj teatr.
I managed[Perf] to obtain[Perf] a ticket to the Bolshoy theater.

b. Turisty uspeli sest' na poslednij avtobus.
The tourists managed[Perf] to get[Perf] on the last bus.

The lexical meaning of the matrix verb pertains to the final endpoint of the complement event; this may explain why the perfective viewpoint is obligatory. Implicative verbs license an implicature that the complement predication has taken place. To say 'X succeeded in doing Y', for instance, implies that 'X did Y' (Karttunen 1971). Other Russian implicative verbs are *udat'sja* (to accomplish), *zabyt'* (to forget).

There is a curious syntactic exception to the requirement just given. In conjunctions, implicative verbs take the imperfective:

(66) Kak ty uspevaeš' i rabotat' v institute, i vesti xozjajstvo i vospityvat' syna?
How do you manage to work[Impf] at the institute, do[Impf] the housekeeping, and raise[Impf] a son?

The perfective is impossible with any one conjunct. The sentence presents parallel

ongoing situations; apparently the parallelism overrides the viewpoint requirement of the implicative verbs.

Super-lexical verbs form another class of matrix verbs with infinitive complements. They require imperfective infinitives:

(67) a. Arkadij dostal poslednij nomer žurnala i načal čitat'.
Arkady got the last issue of the magazine and began to read[Impf].

b. Kuz'mičov tol'ko čto končil sčitat' den'gi.
Kuz'michov had just finished counting[Impf] the money.

Other matrix verbs requiring imperfective infinitive complements include *učitsja* (learn how to), *privykat'* (get used to), *nadoedat'* (get tired of).

Motion verbs also require imperfective infinitives as complements. An infinitive after a verb of motion is overwhelmingly found in the imperfective viewpoint (Forsyth 1970:278-282):

(68) a. I, nakonec, poprosil ego uznat'. . . topitsja li ešče banja . . . ordinarec . . . ničego ne skazal, a . . . pošel uznavat'.
And finally (he) asked him[Perf] to find out[P] whether the bath-house was still heated. The orderly . . . said[Perf] nothing but went[Perf] to find out[Impf].

b. Nikita vernulsja domoj i sel čitat' *Vsadnika bez golovy*.
Nikita returned home and sat down[Perf] to read[Impf] *The Headless Horseman*.

The complements emphasize the occurrence of the events, giving a semantic motivation to the viewpoint requirement.

Conventions of Use for Infinitives

Open interpretation: Recall that the Statement of Fact convention allows imperfective sentences to have closed interpretations. This convention is not commonly used for infinitives, as Russodova notes: the most likely reading of an imperfective infinitive is open. In (69), for instance, the complement presents an ongoing situation or an habitual stative.

(69) Ja prošu vas prinosit' učebnik na seminar.
I request you to bring[Impf] a textbook to the seminar.

This is a statistical tendency only, and Statement of Fact interpretations of imperfective infinitives are not entirely excluded.

Inferred inceptive: In certain contexts the imperfective infinitive implies an initial endpoint, for instance:

(70) a. Nado vyključat' svet i ložit'sja spat'.
It is necessary to turn off[Impf] the light and lie down[Impf] to sleep.

b. Avgust podošel k koncu i ja sobralsja uezžat'.
August came to an end and I prepared to leave[Impf].

Here, the imperfective viewpoint emphasizes the ongoing situation. The key to understanding these examples is the contrasting interpretation of the perfective viewpoint. The perfective would be grammatical, but the Final Emphasis convention would emphasize the result.

Verbs of speaking: these verbs frequently appear with perfective viewpoints in infinitive complements, though they generally take the imperfective in the past tense. Thus in (71) the verb is past tense and perfective, the infinitive is imperfective (from Rassudova (1982)).

(71) a. Nado skazat' emu o sobranii.
It is necessary to tell[Perf] him about the meeting.

b. –Ja uže govoril.
–I have already told[Impf] him.

Similar examples suggest that a wide class of verbs, including verbs of knowledge and communication, follows this pattern. (72-73) illustrate:

(72) a. –Ty ne znaeš', on zvonil professoru?
–Would you happen to know, did he call[Impf] the professor?

b. –Ne znaju, znaju tol'ko, čto xotel pozvonit'.
–I don't know, I know only that he wanted to call[Perf].

(73) a. Ja videl nedavno svoego naučnogo rukovoditelja.
I saw[Impf] my academic advisor recently.

b. Mne nado uvidet' svoego naučnogo rukovoditelja.
I must see[Impf] my academic advisor.

The verbs in (73) mean 'to meet and communicate,' and they follow the pattern of verbs of speech. If the perception sense were intended, the perfective viewpoint would be appropriate and not the imperfective.

This discussion deals with only a few infinitival constructions. The conventions of viewpoint use are complex for the infinitive; they are often tendencies rather than sharp distinctions. We have shown that the choice of viewpoint for the infinitive may often be understood with the same criteria used for finite verbs. However, there are many exceptions, most of which depend on the matrix verb constellation.

10.5 Negation

We discuss here the interaction of negation with aspectual viewpoint. The question of scope—what is being negated?—arises immediately. This question is often difficult to answer. The problems are well-known in descriptive work on Russian aspect and provide useful material to test and develop the two-component approach.

The difficulty is due to the complex aspectual information conveyed by a sentence, and the opacity of negative syntax. The scope of negation is not syntactically coded. The negative may include more than one type of aspectual information in its scope—situation type, viewpoint, pragmatic emphasis, or the conventional understanding. Moreover the choice of viewpoint under negation involves modality and volition, factors which are not strictly aspectual. The traditional literature contains many interesting observations, often subtle and clever; yet the interaction of the various elements of aspect under negation remains unexplicated. We lay out the problem here by presenting a group of the basic cases, and offer a tentative account of them.

In a negative Accomplishment sentence, different denials are associated with its perfective and imperfective forms.

(74) Ja ešče ne pročital/čital ètu stat'ju.
I have not yet read[Perf/Impf] this article.

The perfective specifically denies that the speaker completed reading the article; the imperfective, on the other hand, denies that the action was initiated (Rassudova 1982:62). This contrast holds generally for Accomplishments, as in the following examples:

(75) a. Bilety ešče ne prodali/prodavali.
(They) have not yet sold[Perf/Impf] the tickets.

b. Sportsmen ne otdoxnul/otdyxal.
The athelete did not rest[Perf/Impf].

One possible explanation for the two interpretations requires that the endpoints of the event be visible. The denial of initiation would result from the initial endpoint being visible to negation. The denial of completion would result from the final endpoint's visibility to negation.

This rather ad hoc approach is not open to us. We are committed to the traditional analysis, in which neither endpoint of a situation is visible to the imperfective viewpoint. There is independent evidence, involving negation, for this analysis. The *when*-clause test shows that the initial point in such negative sentences is not semantically visible:

(76) Ja ne čital stat'ju, kogda ona vošla.
I was not reading[Impf] the article when she entered[Perf].

The main clause of (76) means that at the time she entered, the speaker was engaged in some activity other than reading the article. The clause cannot be a denial of having begun the article when she entered, which would be a reasonable interpretation if the initial endpoint were visible.

We appeal instead to simple pragmatic inference. Interpretation of the negated imperfective infinitive follows, we claim, from the aspectual structure of the clause. The imperfective makes visible the process interval of an Accomplishment (*čital*, read), and it is this process which is negated. The inference is straightforward that if a process did not take place, it was not begun.

Achievements whose preliminary stages may be focused with the imperfective viewpoint function in the same way. The perfective is used under negation to deny that the preliminaries culminated in the event, and the imperfective is used if the event did not take place at all:

(77) a. Kolja bežal za nim, ne dognal i pošel iskat' Lozovskogo.
Kolja ran after him, didn't catch up[Perf], and went to look for Lozovskij.

b. Kolja ego ne dogonjal.
Kolya did not (attempt to) catch up[Impf] to him.

When a perfective has a resultative interpretation, the negation may refer to the result; the following example is from Rassudova (1982:64):

(78) a. –Vy mne ne prinesete poslednij nomer "Novogo mira"?
–Could you bring[Perf] me the latest issue of "Novyj mir"?

b. –"Novyj mir" my v ètom godu ne vypisali.
–We didn't subscribe[Perf] to "Novyj mir" this year.

The imperfective viewpoint often appears in categorical denials; it is ungrammatical in other negatives. The categorical denial includes the complement as well as the main verb of a sentence; contrast (79a-b):

(79) a. Kolja ničego ne našel/naxodil.
Kolja did not find[Perf/Impf] anything.

b. Kolja ne našel/*naxodil kluč.
Kolja did not find[Perf/Impf] the key.

(79a) is a categorical denial and can be perfective or imperfective. This semantic category apparently overrides the value of the basic verb constellation. The constellation is an Achievement without preliminaries and would not otherwise allow the imperfective. Thus (79b), with verbal negation only, is ungrammatical with the imperfective. (80) presents additional examples of categorical denials with the imperfective viewpoint; (80b) is due to Guiraud-Weber.

(80) a. –Kakuju telegrammu? –peresprosila mat'. –My nikakoj telegrammy ne polučali.
–What telegram? –mother asked. –We didn't receive^{Impf} any telegram.

b. –Ty vzjala nož ? –Ja ne brala.
–Did you take^{Perf} the knife? –I didn't take^{Impf} (it).

In all these cases, the result of negation is a derived Stative. The use of the imperfective follows directly from this, since the imperfective viewpoint is obligatory for states.

Categorical denials do not deny the result of a particular occasion or attempt. Rather, they deny the result over a period of time, so that the denial constitutes a stative. This is why such denials are often associated with indefinite pronouns, as in (79a) and (80a).

Appendix: Tests for the viewpoint aspect of a verb form

The viewpoint conveyed by a given verb form is usually quite clear to anyone who knows Russian. The only uncertainty involves the few bi-aspectual verbs which may serve to express either viewpoint. We provide some tests for viewpoint. They demonstrate the extent to which viewpoint is grammaticized in Russian.

1. A verb in the *Non-past* tense (see Section 3.1) indicates Future if it is perfective. If it is imperfective, the typical interpretation is Present, often overlapping with the moment of speech, as in (ia). Historical past (ib) or predicted future (ic) interpretations are possible:

(i) a. On čitaet/ pročitaet pis'mo.
He is reading^{Impf}/will read^{Pf} the letter.

b. Zavtra my uezžaem.
We are leaving^{Impf} tomorrow.

c. Marks priezžat v Pariž v 1848-om godu.
Marx arrives in Paris in 1848.

2. Only an imperfective verb can combine with the stem *bud-* to form an periphrastic future:

(ii) On budet čitat'/*pročitat' pis'ma vse utro.
He will read$^{Impf/*Pf}$ letters all morning.

3. Only imperfective verbs combine with superlexical verbs such as *nacat'* (to begin), *koncit'* (to end, finish), *perestat'* (to stop, cease), and *prodolzat'* (to continue); only a perfective combines with completive verbs such as *uspet'* (to manage (to)), *udast'sja* (to succeed in).

(iii) a. On načal čitat' /*pročitat' pis'mo.
He began to read$^{Impf/*Pf}$ the letter.

b. Emu udalos' pročitat"/*čitat' pis'mo.
He managed to read$^{Pf/*Impf}$ the letter.

4. Certain participial forms can be derived only from stems of a given viewpoint. The present active adjectival participle (in *-šč-*) and the present passive adjectival participle (in *-(o)m-*) can be formed only from the imperfective aspect. In addition, the adverbial participle in *-a* is typically formed only from imperfective verbs, although for a restricted set of verb stems it includes perfectives as well. For example:

(iv) a. Mal'čik, čitajuščij/*pročitajuščij knigu.
The boy reading$^{Impf/*Pf}$ the book.

b. Stat'ja, citiruemaja/*procitiruemaja nami.
The article cited$^{Impf/*Pf}$ by us.

c. Čitaja/*Pročitaja knigu.
(While) reading^{Impf}/*having read^{Pf} the book.

The past passive adjectival participle in *(o)n-/t* is formed almost exclusively from perfective stems; the adverbial participle in *(v)ši* is largely restricted to the perfective viewpoint in the contemporary language, although imperfective forms were possible as recently as in the nineteenth century and are acceptable today as bookish or archaic:

(v) a. stat'ja, napisannaja/*pisannaja sovetskim učenym.
The article writtenPf/*Impf by the Soviet scholar.

b. Skazav/*Govoriv neskol'ko slov . . . .
Having said^{Pf}/*Having been saying^{Impf} a few words . . . .

5. The choice of viewpoint determines the interpretation of adverbial *when* (*kogda*) constructions; in a sentence of the form 'When A, B', a perfective clause A implies sequence and an imperfective clause B implies simultaneity.

(vi) Kogda ja pek/ispek bliny, mat' vernulas'.
When I was cooking^{Impf}/had cooked^{Pf} the pancakes, mother returned.

6. Maslov (1959:166) notes that only an imperfective verb can be used in response to the question *čem èto on zanjat* (What is he engaged in doing?) This test is restricted to certain types of situations and is somewhat circular (since the copular verb is imperfective), but it is useful in conjunction with the other tests.

(vii) On zanjat ètem, čto pišet pis'ma.
He is occupied with writing^{Impf} letters.

Notes

[1] There is a long tradition of work on Russian aspect. Some basic sources in Western languages are Jakobson (1932, 1957), Isačenko 1960, 1968, and Forsyth 1970. More recent work which surveys the issues include Guiraud-Weber 1987, 1988, Lehmann 1984, 1988 and Mehlig 1981. Reference to works in Russian can be found in these sources.

The analysis offered here is squarely in this tradition. Our goal is to present the essentials of Russian aspect in the framework of the two-component theory of aspect. We will refer to a particular work when appropriate, but this chapter does not pretend to be a detailed study of Russian aspect or of the history of the topic.

[2] Because verbal affixes contribute to both situation type and viewpoint, discussion of Russian aspect has traditionally focused on the verb. Aspectual choices is often seen as involving paired perfective and imperfective verb forms, and independent of context. But recent work shows conclusively that the sentence is the locus of aspectual meaning.

[3] A simple, unprefixed stem is one that would not be analyzed as derived with a prefix in a synchronic grammar. There are various historically frozen forms in which a prefix has become fused with the root, forming a new root. Most unprefixed stems are morphologically imperfective; exceptions number under fifty.

[4] How to treat verbs which systematically occur in paired forms is an unresolved issue in Russian linguistic. The pairs have identical lexical meanings, but differ in viewpoint meaning. Moreover, viewpoint holds of the entire sentence although the form appears on the verb.

Many affixes have gradually lost their original semantic meaning as the language has developed over time. Affixes that once had a spatial meaning first convey transferred or metaphoric lexical meanings, and later refer to various temporal stages of situations without making other lexical contribution. Some scholars (e.g., Maslov 1948 and Isačenko 1960, following Karcevski 1927) maintain that there are virtually no empty prefixes in Russian. They claim that each prefix introduces some new element of lexical meaning in addition to expressing the perfective viewpoint; see Molosnaja 1973 for a survey. Boguslawski 1963a, 1963b and others opt for the notion of empty prefixes, in part because such prefixes do not introduce lexical meaning beyond that of the perfective viewpoint. The two-component approach makes no prediction in this matter; we do not pursue it here.

When only one viewpoint form is available to speakers, the conventions must allow for that form. And in fact the imperfective form is generally available and conventionally acceptable.

[5] The semelfactive suffix *-nu-* is both morphologically and semantically distinct from another suffix of the same phonological shape. The other suffix is associated with imperfective unprefixed stems and typically conveys an inchoative meaning; e.g., *merznut'* (to freeze -intransitive). The latter suffix is often called "droppable-*nu*-" because it undergoes truncation in some (or all) past tense forms, e.g., *on merz, ona merzla* (he was freezing, she was freezing).

[6] Certain examples may suggest that the imperfective can refer to the preliminary stages of other situation types as well; for example:

(i) On pisal, no ni stročki ne napisal. (Maslov 1948)
He wrote^{Impf}, but did not write^{Pf} a line.

But such constructions are not generally possible: one cannot say, for example, **On stroil, a ničego ne postroil* (He built^{Impf}, but didn't build^{Pf} anything). We suggest that the preliminaries reading of (i) follows from the lexical meaning of the verb: the lexical span of *pisat'* (to write^{Impf}) need not be restricted to putting words to paper, but could include composing these words in one's mind.

[7] The West Slavic languages, Polish but especially Czech, differ from Russian in this respect; see, for example, Eckert 1984.

[8] Habitual statives are licensed by a consistent pattern of repetition; see Chapters 2 and 3. The habitual is distinct from other patterns, such as occasional or sporadic action. The notion of a 'sporadic action' is sometimes discussed in the Slavic literature Sporadic actions are not necessarily derived Statives, and allow the perfective:

(ii) a. Inogda vdali pokažetsja korabl'.
Occasionally a ship would appear^{Perf} in the distance.
b. Vot tak inogda privjažetsja kakoj-nibud' motiv i ne vyxodit iz golovy.
Sometimes a theme gets^{Perf} stuck in your mind and doesn't leave^{Impf} your head.

Curiously, such a use of the perfective among finite forms is only possible in the non-past tense; if the sentences above are put in the past tense, the imperfective is required. Perhaps sporadic occurrences are seen as patterns and thus as derived States in the past tense.

Infinitives function like non-past finite forms in blocking the conceptualization of sporadic repetition as a derived State and permitting the perfective in such contexts:

(iii) a. Ja xotel inogda otvetit' na ego pis'ma.
I wanted^{Impf} to occasionally respond^{Perf} to his letters.
b. On mog ežeminutno poterjat' dorogu.
He could^{Impf} lose^{Perf} his way at any minute.

Contrast (i) with a corresponding construction in the past tense:

(iv) Ja inogda otvečal /*otvetil na ego pis'ma.
Sometimes I responded$^{Impf/*Perf}$ to his letters.

[9] It is not possible to test whether these sentences appear with the Russian completive verb zakonč (finish). The verb requires an imperfective complement verb thereby ruling out the perdurative and delimitative prefixes, which form perfectiva tantum verbs.

CHAPTER 11

THE ASPECTUAL SYSTEM OF MANDARIN CHINESE

11.1 Introductory characterization

The Mandarin language has a rich viewpoint component with three perfectives, three imperfectives, and a neutral viewpoint. Viewpoint morphemes are syntactically optional, making the neutral viewpoint always available in principle. The presence of an explicit viewpoint morpheme therefore carries a certain emphasis not available in languages for which viewpoint is syntactically obligatory. One perfective and one imperfective viewpoint conform to the general Universal Grammar schemata. The other viewpoints represent parametric variation which requires special statement.[1]

The language is strikingly indeterminate on the surface. There is a class of verbal complement suffixes which plays a role in both components of the aspectual system. The suffixes convey viewpoint and/or situation aspect, depending on individual forms and syntactic context. The major situation types are covert categories in Chinese, expressed by verbs and their arguments.

Temporal location is given by adverbials and modal auxiliaries. Mandarin does not have tense, so that explicit indication of temporal location is optional. The surface indeterminacy and optionality of temporal location information contribute to strong reliance on context and pragmatic conventions of use.

11.2 Viewpoint Aspect

11.2.1 The Perfective Viewpoints

Mandarin has two main perfectives, the *-le* and the *-guo* viewpoints. They differ in span: *-le* spans the initial and final endpoints of an event, while the span of *-guo*

extends beyond the final endpoint of a situation. In addition to its viewpoint function, the *-guo* perfective has the essential elements of a Perfect construction. There is also a lexical perfective, a marked situation type known as the Tentative.

Termination and completion are distinct concepts in Mandarin. The perfective viewpoint morphemes are terminative. Completion is indicated by separate morphemes which also give information about a result state, emphasis, or lexical color. The morphemes are known as Resultative Verb Complements (RVCs).

The dual structure gives perfective constructions unusual range and complexity. I use the term 'perfective' for *-le* and *-guo*, and call the other morphemes associated with the perfective 'RVCs', following standard practice. The perfective morphemes and RVCs may occur together or separately; both are syntactically optional. Sentences with perfective morphemes alone are 'simple perfectives.'

Perfective -le

The perfective morpheme suffix *-le* follows the verb. It appears with all types of events, as (1) illustrates. English translations are in the past tense; since Mandarin has no tense, and its viewpoints are unique, translation into English cannot be entirely faithful. Grammatical morphemes are indicated with capital letters.[2]

(1) a. Tamen zuotian zai gongyan chao-le yi-jia.
They yesterday in park quarrel-LE one fight.
They quarreled yesterday in the park. (Activity)

b. Wo zuotian xie -le yifeng xin.
I yesterday write-LE oneCL letter.
I wrote a letter yesterday. (Accomplishment)

c. Lisi huran kesou-le.
Lisi suddenly cough-LE.
Lisi coughed suddenly. (Semelfactive)

d. Zhangsan zai zhongwu dao-le shanding.
John at noon arrive-LE hilltop.
John reached the top at noon. (Achievement)

The morpheme *-le* is perfective, presenting a closed event. The type of closure is unvarying for Activities, Semelfactives, and Achievements; the temporal schemata for these events allow only one possibility. Accomplishments, however, may be either terminated or completed. The simple perfective viewpoint semantically conveys termination, not completion. I demonstrate the point with conjunction. If the Accomplishment claim is correct, it should be possible to conjoin a simple perfective sentence such as (1b) with an assertion that the event did not proceed to completion. (2) is such a conjunction with (1b) as the first conjunct:

(2) Wo zuotian xie-le gei Zhangsan de xin, keshi mei xie-wan.
I yesterday write-LE to Zhangsan DE -letter, but not write-finish.
I wrote a letter to Zhangsan yesterday but I didn't finish it.

The sentence is felicitous in Mandarin, as is well-known (Chu 1976, Rohsenow 1978), though it is contradictory in English.

Completion is expressed unequivocally in Mandarin with certain Resultative Verb Complements. With an Accomplishment sentence the RVC *wan* conveys completion, as in (3):

(3) a. Wo zuotian xie-wan-le yifeng xin.
I yesterday write-RVC-LE a letter.
Yesterday I wrote a letter (and finished it).

b. Ta xiuli -hao-le yi-ge luyinji.
He repair-RVC-le oneCL tape recorder.
He repaired a tape recorder (and completed the repair).

Since these sentences semantically express completion, they are not compatible with an assertion that the event continues:

(4) #Ta zuotian xie-wan-le yifeng xin, keshi mei xie-wan.
He yesterday write-finish-LE a letter, but not write-finish.
Yesterday he write-finish a letter, but he didn't finish it.

Mandarin thus separates the notion of completion from that of simple closure. Pragmatically the simple perfective suggests completion. In fact, the most natural interpretation of (1b) would be that the letter was finished. But the completive interpretation is conversational only: it can be cancelled by other information (Grice 1975).

When stative verb constellations occur with *-le*, they have a dynamic, shifted, interpretation. The derived situation type may be inchoative, presenting the coming about of a state, as in (5):

(5) Wo bing-le.
I sick-LE.
I got sick.

The sentence has only the inchoative reading. The obligatory shift shows that the perfective does not appear with statives.

Adverbials which indicate the final endpoint of a state also trigger a shift in situation type. For instance, (6) presents the closure of a situation, a dynamic event, although the verb constellation at the basic level of categorization refers to a state.

(6) Wo zai nali zhu-le liang-ge yue.
I at there live-LE two CL month.
I lived there for two months.

The situation is dynamic because the change out of a state is an event. See Chapter 3 for discussion of shifts to derived situation types.

Summarizing, perfective *-le* presents closed events of a single point or an arbitrary final endpoint. RVCs contribute to the perfective viewpoint, and semantically convey completion.

The verb-final perfective *-le* discussed in this section must be distinguished from the independent particle *le*, which appears at the end of a sentence. Sentence particles primarily indicate speaker attitude and emphasis (Li & Thompson 1981, Chan 1980). They may have other functions, and may overlap with the aspectual system. Sentence particles are beyond the scope of this discussion; see note 6.

The *-le* perfective is very close to the perfective viewpoint of Universal Grammar. The perfective applies to non-stative situations and spans their initial and final endpoints. What is unique to Mandarin is the independent specification of completion by Resultative Verb Complements. Schematic statement of the viewpoint is given in (7). *I, F* denote endpoints of the situation; *E* denotes a single-stage event.

(7) Temporal schema for the *-le* Perfective

a. *I F/E*
////////(RVC)

b. *Le* (S) makes visible a situation S at interval I. For times $t_{i,j}$, t_n, included in I: there is a time t_i that coincides with *I* and a time t_j that coincides with *F*, or a time t_j that coincides with *E*. There is no time t_{i-1} in I that precedes *I/E*.

The requirement of endpoints correctly excludes statives from this viewpoint. The nature of the endpoint is not specified here; the notation (RVC) indicates that RVCs are optional.

Perfective -guo

The verbal suffix *-guo* is also conveys the perfective viewpoint. *Guo* presents a prior closed situation of any type, and conveys that its final state no longer obtains. The situation type is stative: the construction presents a resultant state of affairs. The *-guo* perfective usually has experiential force, with the effect of a Perfect (Chapter 5). The perfective morpheme *-guo* is toneless and thus unlike RVC *guo*; which has an optional 4th tone, and the verb guo, with 4th tone.

The *-guo* viewpoint conveys a discontinuity with the present or other Reference Time. The discontinuity is both temporal and situational: the final state of the earlier situation no longer obtains, for transitory resultant states. In this the *-guo* and *-le* perfectives are quite different. Consider the contrast between (8a-b); they are identical except for the perfective morphemes.

(8) a. Tamen shang ge yue qu-le Xiang Gang.
they last CL month go-LE Hong Kong.
Last month they went to Hong Kong (they may still be there).

b. Tamen shang ge yue qu-guo Xiang Gang.
they last CL month go-GUO Hong Kong.
Last month they went to Hong Kong (they are no longer there).

Guo requires a discontinuity with the present, whereas *-le* does not. The sentences are felicitous under different circumstances. (8a) is felicitous whether or not the voyagers are still in Hong Kong; but (8b) can be said only if they are no longer there.

The *-guo* construction is best translated with the English Perfect, though the English construction does not convey discontinuity. The following pair, from Chao 1968, is also illustrative:

(9) a. Wo shuaiduan-le tui.
I break-LE leg.
I broke my leg (it's still in a cast).

b. Wo shuaiduan-guo tui.
I break -GUO leg.
I have broken my leg (it has healed since).

Again, discontinuity distinguishes the *-guo* perfective.

These examples present telic situations with transitory result states. They involve motions or paths which are reversible, such as coming and going; or metaphorical paths with a return to a state of affairs that is natural or basic, such as sickness and healing. They have affected subjects or objects, rather than experiencer subjects. In these cases the notion of discontinuity has real force.

But there are many other sentences for which the notion of discontinuity is irrelevant, as Yeh 1993 points out; for instance:

(10) a. Lisi da-guo wangqiu.
Lisi play-GUO tennis.
Lisi has played tennis before.

b. Wo kan-guo naben shu.
I read-GUO thatCL book.
I have read that book.

Atelic situations like (10a) do not involve a change of state: after playing tennis, or strolling in the park there is no result, nor real discontinuity. Moreover, telic situations such as eating a meal or reading a book (10b) have non-transitory final states which hold permanently. Any discontinuity posited holds only vacuously for these and other non-transitory resultant states.

The endpoint interpretations of *-guo* perfectives are like those of *-le*. The viewpoint makes visible an arbitrary final endpoint for durative events and a single point for instantaneous events. Pragmatic understanding of completion is not uncommon in conversation, although only an RVC unequivocally indicates completion. The *-guo* viewpoint appears with stative verb constellations, as (11) illustrates:

(11) Wangping qian-guo wo yi-bi zhang.
Wangping owe-GUO I one-CL debt.
Wangping has owed me a debt (and no longer does).

Here the viewpoint extends beyond the state itself, and beyond the change out of the state, or final endpoint.

In the experiential sense, *-guo* functions as a temporal quantifier ranging over a set of situations, as shown in the semantic analysis of Yeh 1996. Like the quantifiers *always* and *sometimes*, *-guo* presents a given situation as a member of a set. The quantificational meaning underlies the experiential force of *-guo*.

Experiential *-guo* requires a repeatable situation. The requirement guarantees the indefinite reading, since such situations that can occur more than once form a class. The *-guo* perfective is sometimes called an indefinite, "specifying the occurrence of a situation as one of a class of occurrences" (Iljic 1987:71). One can conclude that at least one situation of the class has taken place. (12) brings out the indefinite, experiential meaning of the *-guo* perfective.

(12) a. Ni chi-guo Zhongguo fan meiyou?
You eat-GUO Mandarin food not?
Have you ever eaten Mandarin food?

b. Chi-guo.
Eat-GUO.
Yes I have.

Indefinite sentences with *-guo* may have a specifying temporal adverbial. The adverbial specifies a class of cases (Iljic 1987:56):

(13) Wo xiawu wu dian zhong kan-guo dianying.
I afternoon 5 o'clock see GUO movie.
I have been to the movies at 5 o'clock in the afternoon.

In (13) the adverbial is within the scope of the verb constellation.

The *-guo* perfective, like other Perfect constructions, involve two times. Neither time need be made explicit in the sentence. The default Reference Time (RT) is the Present. Situation Time (SitT) is anterior to RT. Temporal adverbs specify either RT or SitT, depending on position and other factors. With appropriate adverbials and context, *-guo* sentences may have Past or Future RT.

Specific situations may also be presented with the perfective *-guo*, as noted in Chao 1968. (14) illustrates. The questioner clearly wants to know whether Zhangsan has already eaten at a specific time, not whether he has ever had the experience of eating (Iljic 1987:176).

(14) Zhangsan chi-guo fan meiyou?
Zhangsan eat-GUO food not?
Has Zhangsan eaten (yet)?

Since there is no formal marker of the indefinite, sentences that are ambiguous between the two readings can be constructed:

(15) Wo he-guo jiu-le.
I drink-GUO alcohol-LE.

a. Indefinite: I have drunk alcohol (at some time).
b. Specific: I have drunk (my drink of) alcohol now.

On the indefinite reading, (15) means roughly "I have had the experience of drinking an alcoholic beverage"; on the specific reading it means something like "I have had my drink" (you can remove the glass). The specific reading of these examples shows that the indefinite reading is not an essential characteristic of the construction. This account does not exhaust the meanings of the *-guo* perfective; for further discussion see Chao 1968, Iljic 1987.

Summarizing, sentences with the *-guo* viewpoint have the essential properties of a Perfect construction. They present a situation which occurs prior to RT, and ascribe to an experiencer the property of having participated in the situation. There is an additional requirement of discontinuity. In the experiential use, *-guo* functions as a temporal quantifier. *Guo* affects both situation type and viewpoint, not unusual for a Perfect construction. The aspectual information of *-guo*, affects viewpoint and situation type, and requires a two-level structure:

(16) Aspectual structure of the *-guo* perfective
$[_c[_b[_a[\text{verb constellation}] + guo]_{\text{Stative}}]\ _{\text{Perf}}]$

The verb constellation may be of any situation type (a); within the scope of ***-guo***, however, its situation type is Stative (b). The viewpoint of the whole is perfective (c), with the span given below in (17).

The two-component theory can account for the discontinuity of *-guo* in terms of viewpoint span. The span includes the prior closed situation and a post-final stage not part of the situation itself. The post-final state is significant for affected subjects and objects, vacuous for atelic events and other telic events.[3] The span of the viewpoint does not concide with the temporal schema of the situation, and must be independent of it. Formally, viewpoint information is located at an independent interval; see Chapter 7.

Guo makes visible an interval from the initial endpoint of a situation to a stage which follows the final endpoint, as in (17). *F+1* denotes a post-final change of state.

(17) The Mandarin *-guo* perfective viewpoint
a. *I.....F/E F+1*
////////////////

b. *Guo* (S) makes visible a situation S at interval I. For times $t_{1,j}$, t_n, included in I: there is a time t_i that coincides with *I*; and/or a time t_j that coincides with *F/E*, and a time t_n that follows *F/E* and coincides with *F+1*. There is no time t_{i-1} in I that precedes *I/E*.

The endpoint provisions allow for Statives and instantaneous events: they have a final endpoint *F* (change out of the state) or a point *E*, followed by a post-final stage. A more complete statement would require a framework for temporal location in Mandarin, not given here.

Resultative Verb Complements and the Perfective Viewpoint

RVCs contribute to the perfective viewpoint and to the specification of situation type. RVCs may occur with the perfective morphemes; they also convey the perfective viewpoint alone.

The 'phase' class of RVC affirm termination or completion; the term is from Chao 1968. There are two types of phase RVCs, flexible and strictly completive. The RVCs of (18) indicate strict completion (*zhao, hui, cheng* etc.) and require telic verb constellations:

(18) a. Wo xue-hui-le Fawen.
I learn-RVC-LE French.
I learned French.

b. Ba zhe-ge juzi gai-cheng wen ju.
BA this CL sentence change-into ask sentence.
Change this sentence to a question.

Other RVCs are flexible, indicating completion or termination (*wan, hao, guo,* etc). (19) illustrates; *-guo* is an RVC in (19b).

(19) a. Ta ba ge chang-wan-le.
He BA songs sing RVC-LE.
He sang songs.

b. Ta-men xinshang-guo-le yichang dianying.
he PL enjoy RVC-LE oneCL movie.
They enjoyed the movie.

Telic verb constellations appear with strictly completive and flexible RVCs; but atelic constellations appear only with flexible RVCs. This distribution is one factor establishing telic situation types as covert categories in Mandarin. RVCs are discussed further in section 11.3.1.

The Mandarin perfective cannot be directly translated into a language that does not code termination and completion separately. To render (20a) into English, for instance, one must construct the first conjunct with a different verb or a different viewpoint, as in (20b-c).

(20) a. Zhangsan xue-le Fa-wen, keshi hai mei xue-hui.
Zhangsan learn-LE French, but still not learn-RVC.

b. Zhangsan studied French but he never actually learned it.
c. Zhangsan was learning French but he never actually learned it.

English has no direct counterpart of (20a), since the English perfective conveys completion. The Mandarin verb *xue* means *study-to-learn.* When *study* is atelic in meaning, the verb is *nianshu.*

Tentative reduplication

Mandarin has a lexical perfective, formed with reduplication of the main verb. Sentences with this reduplication present a situation as closed, of short duration, and of little importance; (21) illlustrates:

(21) a. Wo zou-(yi)-zou.
I walk one walk.
I do a little walking.

b. Zheige wenti wo xuyao yanjiu yanjiu.
thisCL problem I need research research.
I need to do a little research on this problem.

The sentences of (21) are semantically perfective because they present closed situations. This reduplication (there are others) is called the Tentative Aspect in Chao 1968. The Tentative is often used to refer modestly to one's own activities, or for mild imperatives. The construction involves both aspectual components. It has the perfective viewpoint; it also creates a unique situation type and therefore belongs to the situation type component of the aspectual system.

The construction is on the borderline between morphology and syntax (Chao 1968:205). It can be analyzed by a productive lexical rule, an approach which accords with Chao's comment. The Tentative is an Activity in situation type(section 11.3.3).

11.2.2 The Imperfective Viewpoints

Imperfective viewpoints present a situation from an internal vantage point that excludes the endpoint of a situation. Mandarin has two well-known imperfective viewpoints, *zai* and *-zhe. Zai* is a typical progressive; *-zhe* has a static meaning that is idiosyncratic to the language. I also posit a null imperfective morpheme (ø) which appears with stative verb constellations.

Both overt imperfective viewpoints focus intervals. *Zai* focuses the dynamic stages of non-statives, while *-zhe* has a static, stative focus. There is a good deal of overlap between the two viewpoints.

The progressive: zai

Zai presents an internal interval of a durative situation, and often has the connotations of activity associated with events. (22) illustrates:

(22) a. Tamen zai da qiu. (Activity)
they ZAI play ball.
They are playing ball.

b. Zhangsan zai xie yifeng xin. (Accomplishment)
Zhangsan ZAI write one CL letter.
Zhangsan is writing a letter.

The progressive morpheme *zai* precedes the verb. *Zai* often co-occurs with the morpheme *zheng* and the sentence particle *ne*; these forms appear frequently in spoken and written discourse, and contribute to rhetorical effect (Li & Thompson 1981, Chu 1983).

The progressive viewpoint requires an interval that does not include an endpoint of the event. No such interval is available internally for instantaneous events, and they do not allow the progressive. Achievement verb constellations with the progressive are ungrammatical, as (23) shows:

(23) a. *Ta zai ying sai pao.
he ZAI win race run.
He is winning the race.

b. *Lao Wang zai si.
Old Wang ZAI die.
Old Wang is dying.

There are derived, multiple-event Activity sentences with verb constellations that are semelfactive at the basic level, as in (24):

(24) Zhangsan zai qiao men.
Zhangsan ZAI knock at the door.
Zhangsan was knocking at the door.

(24) requires a shifted interpretation as an Activity. The incompatible combination of semelfactive and the progressive triggers the shift.

Marked progressives with Stative verb constellations occur; they present situations as ongoing, durative, and dynamic. In such cases, the dynamism of the progressive viewpoint is imposed by its temporal schema.

The *zai* viewpoint contrasts with the stative imperfective *-zhe*: both appear with non-stative verb constellations.

The Mandarin progressive is similar to the English progressive, except that it is available only for durative events. The dynamic conceptual property [Stage] is associated with the viewpoint span:

(25) The progressive *zai*
a. I . . . . . F
$////_{[+\text{Stage}]}$

b. *Zai* S presents an internal interval of a dynamic situation S that includes neither *I* nor *F*; and that does not precede *I* nor follow *F*. The interval has the [Stage] property.

For a more formal statement of the progressive see Chapter 6.

The stative imperfective -zhe

The untoned verb suffix *-zhe* expresses an imperfective viewpoint that presents a continuous and stable situation without regard to endpoints. *Zhe* is a resultative stative. It focuses at the basic level on statives of position and posture, and other statives that result from an event. In an extended use *-zhe* presents the internal stages of events in a static manner. (26) illustrates the basic use of *-zhe*.

(26) a. Qiang shang gua-zhe ji zhang huar.
wall on hang-ZHE several CL picture.
Several pictures are hanging on the wall

b. Ta zai chuang shang tang-zhe.
he at bed on lie-ZHE.
He is lying on the bed.

c. Men shang xie-zhe sige zi.
door on write-ZHE 4 CL character.
Four characters are written on the door.

The states presented here are resultative. The viewpoint focuses a stage after the event denoted by the verb constellation. *-Zhe* may also focus on verb constellations that directly denote states:

(27) a. Women bici shen ai-zhe, bici yilai-zhe.
we e.o. deep love-ZHE, e.o. rely-ZHE.
We deeply loved each other, and relied on each other.

b. J. yijing yu ni ge-zhe chong yang.
J. already from you separate-ZHE multiple oceans.
J. was already a million miles away from you.

These statives are stage-level predicates. They are spatially and temporally bounded, applying to stages of individuals (Chapter 2).

Zhe does not occur with individual-level predicates, which denote properties of relative permanence and apply directly to individuals. (28) illustrates:

(28) a. ??Ta yixian chengzhi-zhe.
he always honest.
He is always honest.

b. ??Ta zhidao-zhe zhege huida.
he know-ZHE the answer.
He knows the answer.

c. *Ta conghui-zhe.
he intelligent.
He is intelligent.

The insight that only stage-level predicates allow *-zhe* is due to Yeh. As Yeh points out, stage-level predicates have a potentential for change, whereas individual-level predicates do not (1993:86).

Resultatives and stage-level statives exemplify the direct, unmarked uses of *-zhe*. Justification for taking the stative as basic comes from the consistently stative interpretation of *-zhe* in dialects with both *-zhe* and *zai*, and the fact that statives are more consistently accepted across dialects than are non-statives. Historically the earliest attested uses of *-zhe* are resultative (Paris 1981:203).

The viewpoint also appears in an extended use. *Zhe* presents internal stages of durative events as static, as in (29).

(29) a. Ni dangshi mi-zhe Makesi, Engesi, Liening.
You then fascinate-ZHE Marx, Engels, Lenin.
At that time you were fascinated by Marx, Engels, and Lenin.

b. Quan shijie de ertong dou wan-zhe tong yang de youxi.
whole worldDE child all play ZHE same kind DE game.
All the children in the world are playing the same games.

Finally, *-zhe* appears in the subordinate clause of complex sentences. The imperfective viewpoint has a backgrounding effect, as (30) shows:

(30) a. Tamen zuo-zhe kan bao.
they sit ZHE see newspaper.
Sitting, they read the newspaper.

b. Qi zhe ma zhao ma.
ride ZHE horse seek horse.
Look for a horse while riding a horse. (do something absent-mindedly)

Only durative situations are relevant, since instantaneous events never allow the imperfective in Mandarin.

Stative clauses of stage-level predicates appear with *-zhe* in this context (31); individual-level predicates are ungrammatical (32):

(31) a. Ta shangxin-zhe shuo.
he sad-ZHE say.
He said sadly that.

b. *Ta shangliang-zhe shuo . . . .
he kind-ZHE say . . . .
He said kindly that . . . .

The examples are due to Yeh. The extended use in subordinate clauses is completely grammaticized: *-zhe* is obligatory in this context.

The distribution of resultative *-zhe* is idiosyncratic for many verb constellations. Certain constellations of the Affected Object type are grammatical with *-zhe*, others are not, as (32)-(33) illustrate:

(32) a. Kongqi zhong miman-zhe yigu jiaoqi.
air in fill ZHE oneCL scorched smell.
The air is filled with a scorched smell.

b. Yugan wan-zhe.
Fishing-rod bend ZHE.
The fishingrod is bent.

(33) a. *Fangzi qi-zhe.
house paint-ZHE.
The house is painted.

b. *Huaping puo-zhe.
The vase is shattered.

This idiosyncrasy is typical of verb constellations that are not positional or locative.

Given the possibilities for both external and internal focus with *-zhe*, one can construct sentences that are ambiguous. For instance, (34) has a static resultative and a dynamic event reading:

(34) Tianli zhongzhe huar.
land in plant ZHE flower

a. Flowers are planted in the ground.
b. In the ground flowers are being planted.

The ambiguity arises because of a confluence of factors. Imperfective viewpoints may focus internal or external intervals, and *-zhe* has basic and extended uses. Ambiguity of this particular type is quite unusual, because few of the relevant verbs are both transitive and intransitive. Many location verbs, for instance, are intransitive only; see Paris 1981 for discussion of transitivity in Mandarin.

The temporal schema of the *-zhe* imperfective provides internal or resultative focus, and the static concept imposed by the viewpoint:

(35) The *-zhe* imperfective viewpoint
I/E . . . . .
$///_{Stat}$

a. *zhe* [S] presents a moment or interval of a situation S that includes neither endpoint, and does not precede *I/E*.
b. Intervals focused by *-zhe* have the [+Static] property.

Since application is not limited to a particular situation type, the schema allows for the wide range of uses of the *-zhe* viewpoint.

The two imperfectives of Mandarin are distinct for many speakers, and are analyzed as such in many analyses (Teng 1979, Chen 1979, Chan 1980, Li & Thompson 1981, Paris 1981). However, in some Mandarin dialects, especially in the North, *-zhe* is gradually taking over the function of *zai*, changing from a stative imperfective to a general imperfective. For many speakers there is now little difference between the two. Indeed, the *Xiandai hanyu xuci lishi*, a prescriptive handbook, gives virtually identical accounts of the two forms. The emerging viewpoint holds for statives, resultatives, and non-statives, combining the two imperfectives.[4]

The ø imperfective: stative sentences
Stative sentences frequently appear without an overt viewpoint; in such cases the viewpoint morpheme is null (ø), as in (36).[5]

(36) a. Mali hen gaoxing.
Mali HEN happy.
Mary is happy.

b. Tamen xihuan wo.
He PL like I.
They like me.

c. Wang tongchang he pijiu.
Wang usually drink wine.
Wang usually drinks wine.

There is semantic and distributional support for analyzing stative sentences with a null imperfective viewpoint.

Semantically, the interpretation of statives is open, as the conjunction test demonstrates. (36a), for instance, is compatible with an assertion that the state continues, as (37) shows:

(37) Mali zuotian hen gaoxing, xianzai hai hen gaoxing.
Mali yesterday very happy, now still very happy.
Yesterday Mary was happy, and she still is happy now.

The open reading is typical of an imperfective. Stative sentences do not have a closed interpretation unless they are explicitly bounded. This differentiaties them from sentences with the neutral viewpoint (section 11.2.3 below). When bounded. statives appear with the *-le* perfective, as in (59) below. There is also a distributional reason

to posit the null morpheme for statives: ø contrasts with the overt viewpoint morphemes *-guo* and *-zhe*.

Formally, we provide that the null imperfective viewpoint requires a stative situation, and focuses an interval, as in (38):

(38) The ø imperfective viewpoint
. . . . . .
///
ø [S] presents a moment or interval of a stative situation S.

Since the temporal schema of a stative does not include the change into or out of the state, endpoints are not specified here. Inheritance need not be specified, since situation type information is available in the composite temporal schema of a sentence (Chapter 4).

11.2.3 The Neutral viewpoint

In Mandarin viewpoint morphemes are syntactically optional, and sentences often appear without them in discourse. Sentences that lack viewpoint morphemes (LVM sentences) have the Neutral viewpoint. The viewpoint is open informationally: it spans the initial or single endpoint and at least one internal stage of a durative situation. The interpretations are flexible but not unlimited; see Chapter 4.

With the Neutral viewpoint, a sentence has both open and closed readings. Consider (39), an LVM Accomplishment sentence:

(39) Zhangsan xiuli yitai luyinji.
Zhangsan repair one CLtape recorder.
Zhangsan repaired/is repairing a tape recorder.

This sentence presents a situation that may be ongoing, terminated, or completed. The receiver of (39) may plausibly ask either of the questions in (40), and may receive any of the answers of (41).

(40) a. Ta hai zai xiuli ma?
He still ZAI xiuli MA .
Is he still repairing it?

b. Ta xiuli-hao-le ma?
He finish-RVC-LE MA.
Did he finish repairing it?

(41) a. Hai zai xiuli.
still ZAI write.
He is still repairing it.

b. Xiuli-le.
repair-LE.
He stopped (repairing it).

c. Xiuli-hao-le.
repair-RVC-LE.
He finished (repairing it).

d. Bu zhidao.
not know.
I don't know.

These questions and answers, which are reasonable responses to (40), show that semantically (39) presents an open situation. The receiver may or may not infer that the situation continues.

The *when*-clause can be used with only marginal plausibility as a diagnostic context for LVM sentences, as noted in Chapter 4. I repeat the example here. *When*-clauses usually foreground the main clause, and foregrounded clauses usually have an overt viewpoint morpheme. For speakers who accept them, however, LVM sentences with *when*-clauses may present open or closed situations. Some native speakers accept (42a), for instance, with either of the two readings given.

(42) a. Zhangsan dao jia de shihou, Mali xie gongzuo baogao.
Zhangsan arrive home DE time, Mali write work report.
b. When Zhangsan arrived at home, Mali began to write the work report.
c. When Zhangsan arrived at home, Mali was writing the work report.

The closed, inceptive interpretation of the main clause is given in (42b); the open, ongoing interpretation in (42c). These interpretations show that LVM sentences are neither perfective or imperfective.

The interpretations of the other event verb constellations are predictable in LVM sentences, given the notion of neutral viewpoint and the pattern of the language. Activities may be open or closed; Achievements and Semelfactive are single stage events. The neutral viewpoint does not apply to Statives (section 11.3.4)

There would be further justification for positing a neutral viewpoint if we found that certain readings were blocked in LVM sentences. Evidence from French and Navajo, adduced in Chapter 4, suggests just this. The key cases are Achievements. The preliminary focus of an Achievement is blocked in LVM sentences for languages that allow this focus with overt imperfectives. This finding rules out the possibility that LVM sentences have no aspectual viewpoint. Such a possibility is not available in the two-component theory, which requires that every sentence have an aspectual viewpoint.

The neutral viewpoint focuses a single endpoint and a single stage of durative events. This information allows augmentation to a closed situation. St_1 indicates an internal stage of a durative event.

(43) The Neutral Viewpoint
(Neutral) S, for a situation S at interval I: For times t_i, $_j$, t_n, included in I: there is a time t_i that coincides with *I* or *E*, and a time t_j that coincides with St_1, for situations with *F*. There is no time t_{i-1} in I that precedes *I/E*.

Closed interpretations of durative situations arise by augmentation: the receiver infers the existence of a final endpoint. Statives are correctly excluded because their temporal schema has no endpoints.

The Neutral viewpoint arises by a compositional default rule: it is associated with a clause if the clause has no viewpoint morpheme.

11.2.4 Conventions of Use

Pragmatic conventions play an important role in Mandarin because of the surface indeterminacy of the language. There are many subtle interpretations of syntactic structures, and of the expressive forms of the language. Among the latter are sentence particles that interact closely with viewpoint morphemes.[6] Since this chapter focuses exclusively on the aspectual system it is not possible to give a full account of the conventions of use. Instead, I make some remarks about particular cases.

Temporal location is often conveyed by a perfective or imperfective viewpoint. There is a conventional association of the imperfective with the Present and the perfective with Past. In the absence of other information, including adverbials, the viewpoints are taken to convey these times. Navajo has similar conventions.

The general conventions for narrative texts hold for Mandarin. Sentences with the perfective viewpoint tend to advance a narrative by the convention of Sequentiality: perfectively presented events follow one another in sequence. In contrast, sentences with the imperfective viewpoint provide background information.

The most important pragmatic fact about the viewpoint morphemes of Mandarin is their optionality. Omission of a viewpoint morpheme triggers the neutral viewpoint, which is flexible in interpretation. The conventions for choosing an overt viewpoint morpheme or an LVM sentence interact with those conventions which play a role in determining choice of viewpoint.

There are some interesting studies of conventions for when to use, or omit, the perfective morpheme *-le*. Chang 1986 investigated the function of *-le* in newspaper articles, editorials, and stories. His main finding is that *-le* is "used as an explicit marker for the peak event in a discourse segment" (1986:265). The other factors most likely with overt *-le* were past realis marker for action verbs, monosyllabic verbs, sequences of events, and set expressions of a classical flavor. Verbs of saying and the irrealis particle *cai* (only then) did not favor the use of *-le*. Chang used 80 subjects, native speakers of Mandarin.

In another study, Spanos 1979 found a diversity of use of perfective *-le* that could not be summarized in rules. Spanos conducted an experimental study in which 62 subjects were given short sequences from prose and conversational contexts. They were asked to judge the use of *-le*, or to insert it where appropriate. He found that people were quite sparing in their use of *-le*, requiring it mostly when context was not sufficiently informative.[7] Spanos agrees with other researchers that *-le* is used when context makes it "necessary to explicitly state the realization of a given action." He notes that its appearance often stresses the perceptual realization of a closed situation (Spanos 1979:81). Many of the contexts that Spanos used were short and informal, and less likely to bring out the discourse factors investigated by Chang. The two studies thus complement rather than contradict each other.

RVCs are also optional elements with tacit conventions of use. The simple perfective viewpoint conversationally implies completion, or successful termination, as noted above. RVCs add a particular shade of meaning. For instance, if I want to report

that I bought three books, I would probably use a simple perfective sentence. Adding a completive RVC suggests that I overcame some difficulty and successfully bought the books. (44) illustrates; the contribution of the RVC is conveyed with an implicative verb.

(44) Wo mai-dao-le san-ben shu.
I buy -RVC-LE 3 CL book.
I managed/succeeded in buying 3 books.

In other contexts the RVC may have a different conversational effect. Chu 1983 notes that *dao* (succeed) can indicate straightforward completion if the listener knows in advance about the speaker's plan to buy books. The possible contextual effects, and the shades of meaning of particular RVCs, raise many interesting questions.

These conventions are pragmatic in nature and cannot be stated at the level of syntactic or semantic structure. Consider for example anchoring contexts for the imperfective *-zhe*. Sentences with *-zhe* require a temporal or other anchor, often provided by an event in a syntactically related clause. The subordinate constructions mentioned above function supporting context; indeed, Chu refers to *-zhe* as a concomitant marker (1986:93). Speakers tend to judge independent *-zhe* sentences ungrammatical, or odd at best.

But single sentences with *-zhe* are not odd if the context furnishes an anchor. (45) demonstrates: the sentence of interest, (b), appears in the middle of a description (T'ung & Pollard 1982:243):

(45) a. Zheshi yijian xiangdang da de bangongshi. Yi jin men zuobian fangzhe yi tao shafa, youbian lizhe yi paishujia . . . bangongzhuo.
This is a fairly big office. As you go in the door on the left is placed a three-piece suite, on the right there stands a row of book shelves . . . a desk . . . .

b. Zhuozi houtou zhuozhe yi wei toufa huibai, daizhe yanjing de ren.
Behind the desk sits a middle-aged man, wearing glasses.

What is needed for *-zhe* is a temporal or situational anchoring, which may be expressed in more than one way. This pragmatic statement must be quite abstract to account for the various relevant contexts.[8]

There are pragmatic conventions for use of the neutral viewpoint, or LVM sentences. Although LVM sentences occur in different contexts and genres, two very general conventions can be stated: LVM sentences are possible when (1) the viewpoint information of an LVM sentence would be redundant, because it is conveyed by other means in the sentence or context; or (2) the information conveyed by an LVM sentence is backgrounded rather than foregrounded.

The actual factors involved include syntactic position, the explicit viewpoints in neighboring clauses and sentences, sentence particle, neutral expectations for the situation talked about, and shared knowledge. A full account would also consider general conventions about what can be left unstated and what is redundant.

11.3 Situation aspect

11.3.1 Grammatical features of Mandarin

I begin with some brief comments about the grammar of Mandarin. The language is morphologically simple, without inflection or agreement. Word order is strict and informative.

Nominals: The class of common nouns has no formal distinction between count nouns and mass nouns. Nouns may appear alone; with a demonstrative, e.g. ***zhei, nei*** *(*this, that); with a numeral or quantifying word, e.g. *duo* (many), *ji* (several), etc. Specified NPs always have a classifier, determined by the noun. For instance:

(46) wuge ren — nei-tiao niu
5 CL man — that CL cow
5 men — that cow

In many cases a nominal alone is vague, allowing more than one interpretation. Word order indicates specificity in some constructions: referring NPs often appear to the right of the verb.

If an unspecified NP appears in a referential position it may be taken as a mass noun or a count noun. Thus (47a) has two readings:

(47) a. Wo mai-le shu.
I buy-LE book.
b. I bought the book. (Accomplishment)
c. I bought some books. (Activity)

As (47) shows, NP interpretation can determine situation type. For telic verbs like *buy*, the verb constellation is telic or atelic with the specific and non-specific reading of the NP. The vagueness of NPs increases the indeterminacy of verb constellations in Mandarin.

The specificity of an object nominal affects the interpretation of perfective ***-le*** for some speakers. There is a dialect in which the simple perfective indicates completion, if a specific object nominal appears in an appropriate verb constellation. For this dialect, conjunctions such as (2) above are contradictory: ***Wo zuotian xie-le gei Zhangsan de xin, keshi mei xie-wan*** (I wrote a letter to Zhangsan yesterday but I didn't finish it). The example was cited to show that the simple perfective does not indicate completion. This dialect is not uncommon among people with an extensive exposure to English.

Verbs: The verb is simple in form and has multiple functions. There is no morphological indication of an active or passive verb; or of a transitive or intransitive verb. Word order and other factors in a sentence give this information.

Resultative Verb Complements: RVCs occur with many verbs, usually indicating the perfective viewpoint, as shown above. They often change the lexical meaning of a verb by extending the span to include the direction or result of an event. RVCs contribute lexical color and information about the situation type of a verb constellation.

RVCs function in both the viewpoint and the situation components of the aspectual system. This becomes clear when they are analyzed at the level of the sentence, as required by the two-component theory. In traditional grammars RVCs are discussed mainly at the level of the verb. The traditional approach gives essential information about distributional classes, and about predictable and unpredictable combinations of verbs and RVCs; it underlies the sentential analysis developed here. I summarize the relevant facts briefly below. The RVCs are similar to certain Russian verb prefixes, which also contribute both situation type and viewpoint information (see Chapter 10).

Traditionally RVCs are defined according to their ability to appear as complements in a construction known as the 'potential'. The potential is formed by inserting the morphemes *de* or *bu* between the verb and its complement. By this definition, RVCs fall into two distributional classes, known as Directional and Resultative complements. Directional RVCs indicate direction of action and locate a situation from the point of view of the speaker Resultative complements are of two types: Result State and Phase, or Completive.

(48) a. Directional RVCs (partial list)
shang (ascend), *chu* (out), *guo* (across), *jin* (in, into), *qi* (up)

b. Resultative Result State (partial list)
bao (full), *qingchu* (clarity), *kai* (detachment); *zhu* (fixity), *cuo* (error)

c. Resultative Phase, or Completive (partial list)
jian (sensory perception), *dao* (attainment), *hao* (satisfaction), *cheng*(succeed), *wan* (finish), etc.

Many of the morphemes are also independent verbs or adjectives. The aspectual functions of RVCs differ, roughly according to the three traditional classes.

Directional RVCs generally function in situation aspect, but there are perfective uses as well. (49) illustrates both types:

(49) a. Zhangsan song-lai yige ziangzi.
Zhangsan send-over oneCL suitcase.
Zhangsan sent over a suitcase.

b. Niao fei-shang-qu-le.
bird fly-ascend-RVC-LE.
The bird flew up.

The Directional RVC of (49a) gives deictic and directional information, in addition to

viewpoint. In (49b) the RVC *qu* functions as a perfective morpheme while *shang* adds directional color.

Result State RVCs convey the perfective viewpoint and add lexical material to a verb constellation, extending its span:

(50) a. Zhangsan la-lai-le nei-shan damen.
Zhangsan pull-open-LE that CL gate.
Zhangsan pulled the main gate open.

The RVC specifies the resultant state of a telic event. Phase RVCs function in both situation and viewpoint aspect. In the former they may contribute to telicity, in the latter they contribute to or convey the perfective viewpoint; see section 11.2.2 above.

The combinations of verbs and RVCs are often quite predictable in both form and meaning. The classes tend to have a certain semantic coherence. Examples of predictable combinations are given in (51):

(51) Predictable combinations of verbs and RVCs
Directional: fei-shang (fly up), zou-jin (walk in), na-qi (pick up)
Result State: xie-xingchu (write clearly), tang-ping (lie flat)
Phase: xiuli-hao (repair-good), kan-jian (see), qu-dao (arrive)

There are also combinations that are not predictable. To account for the facts a grammar of Mandarin must have both productive lexical rules for RVCs and listed combinations that are not rule-governed. See Chao 1968, Cartier 1972, Lu 1975, Li & Thompson 1981, Paris 1981.

Phase RVCs frequently form Achievements from Activity verbs in Mandarin. The first member of the pair denotes an atelic process, the second a change of state. The change of state is the outcome of the process, though not a necessary outcome.

(52) Activity	Achievement
kan	kan-dao (look, see)
ting	ting-dao (listen, hear)
zhao	zhao-dao (look for, find)
tao	tao-diao (flee, escape)

Related pairs like this are common in language. As the translations indicate, the English equivalents are not related morphologically. There are a few such pairs in English with morphologic as well as semantic relations, as in (53), but they are relatively unusual.

(53)	
cai	cai-dao (guess, guess)
xiang	xiang-dao (think, think of)

Other RVCs appear in the sections on particular situation types.

11.3.2 Temporal properties in Mandarin

The properties of dynamism, completion, duration, and detachability distinguish the situation types. In this section I show how these properties are realized in the Mandarin language.

Dynamism distinguishes the event situation types. Only events appear with the progressive *zai* and perfective *-le* viewpoints, the Tentative construction, and completive RVCs. The syntactic correlates of agency appear with events: agent-oriented adverbials, instrumentals, and imperatives. Together these properties constitute dynamic syntax. There are no pro-verbs that distinguish statives and non-statives.

Completion, an essential property of telic situation types, has the formal correlate of occurrence with RVCs. Telic verb constellations appear with strictly completive RVCS, whereas others do not.

There are no clear adverbial or verbal correlates of completion. Adverbials with *nei* (in) and simple preverbal adverbials are flexible: they are compatible with duration, completion within an interval, or at an interval.[9] Unfortunately, syntactic tests that rely on super-lexical verbs of completion cannot be constructed either. The super-lexical verbs of Mandarin have idiosyncratic properties: *ting* (stop) appears primarily in sentences with inanimates; *wan* (finish) appears with animates but not in constructions of syntactic embedding. Thus the distributional correlates of completion are limited.

Duration is a property of Activities, Accomplishments, and Statives. It can be demonstrated for events with the main verb *hua* (take time):

(54) a. Zou-guo nei-ge gongyuan hua-le ta liang-ge xiaoshi.
walk RVC thatCL park take-LE he two CL hour.
It took him 2 hours to walk through the park.

b. Ta-men hua-le san nian gai-hao nei-zuo qiao.
he PL take -LE 3 year build-RVC thatCL bridge.
They took 3 years to build that bridge.

Sentences with *hua* involve termination or completion, depending on the sentence in question. These examples are Accomplishments.

There is a syntactic process of verb-copying that correlates with simple duration. Durative adverbials must follow a copy of the verb when they appear with atelic verb constellations; (55) illustrates:

(55) Ta shui jiao, shui-le yige zhongtou.
He sleep, sleepLE oneCL hour.
He slept for an hour.

The process of verb-copying is obligatory for durative adverbials in Activity sentences. Verb-copying does not occur with telic events, for semantic reasons. The verb-copying operation directly relates the durative adverbial to the verb constellation; this relation does not hold between durative adverbials and telic constellations (Paris 1988).

Non-detachability: The process stages of an Accomplishment are not detachable from the situation, so there is an entailment from outcome to process. This entailment is demonstrable in a limited way for Mandarin. There are few perfective Accomplishment sentences that differ only in viewpoint from their imperfective counterparts. For these sentences, if the perfective is true, so is the imperfective.

But for most cases there is no such correspondence, because RVCs are syntactically constrained. Perfective Accomplishments require the presence of an RVC to unequivocally indicate completion, yet RVCs do not appear with imperfective morphemes. The only way to show entailment is with related sentences that differ in viewpoint and in the additional lexical information contributed by the RVC.

Non-detachability is also demonstrable with the adverb *chayidiar* (almost). This adverb produces an ambiguity in Accomplishment sentences because there are two possible scopes: the adverbial may have either the process or the outcome is in its scope.

11.3.3 Activities

Activities are atelic, durative events, e.g. *zou* (walk), *zhao* (look for), ***xinshang*** (enjoy). (56) illustrates; 'Prt' indicates sentence particle.

(56) a. Ta tui-le che-le.
He push-LE cart-Prt.
He pushed the cart.

b. Wo xue Fawen.
I study French.
I studied French.

c. Ta zou-le zai gongyuan.
He walk in park.
He walked in the park.

Like other non-statives, Activity constellations take RVCs. They are compatible with directional and flexible RVCs (as in (49b) above), and are incompatible with strictly completive RVCs.

The properties of dynamism and duration hold of Activities. They appear with dynamic syntax and expressions of duration. The characteristic entailment pattern of Activities allows the inference that if NP was Xing, then NP Xed; and vice versa. This is demonstrable with perfective and imperfective sentences, if there is no RVC.

The class of Activities in Mandarin includes a special situation type, the Tentative construction introduced in 11.2.1. The construction, which is marked by verb redu-

plication, has both situation type and viewpoint features. It indicates a closed situation of short duration and arbitrary endpoints. Sentences of this type are formed from Activity, Accomplishment, or Achievement constellations. The examples illustrate; an optional *-yi-* may appear between the verb and its copy.

(57) a. Ta shui-(yi)-shui jiu hao.
He sleep-one-sleep then good.
He'll be better if he sleeps for awhile.

b. Ni cai-(yi)-cai.
You guess-one-guess.
You do a little guessing (try to guess).

The reduplicated construction can occur only for verbs without RVCs. The restriction is syntactic, since some RVCs are compatible with Activities. The Tentative is a marked situation type, since generally a perfective morpheme conveys the perfective viewpoint. The situation type is also marked because it departs from the major situation types in specifying short duration.

Activity sentences with durative adverbials in post-verbal position have a special copying constraint, noted above. The adverbial must follow a copy of the verb. Such sentences without verb copies are ungrammatical, as in (58b):

(58) a. Wo deng ren deng-le yige zhongtou le.
I wait man wait-LE oneCL hour^{Prt}.
I waited for someone for an hour.

b. *Wo deng ren yige zhongtou le.
I wait man oneCL hour^{Prt}.
I waited for someone for an hour.

The sentence particle *le* (Prt) expresses speaker attitude (see note 6).

Derived Activity sentences are sometimes shifted from basic-level stative verb constellations. They are recognizeable as Activities because they have dynamic syntax, for instance, perfective *-le*. Such sentences are instances of non-standard aspectual choice: they present states as dynamic situations. There is "an implication of change from a different previous condition" (Chao 1968: 699), or the suggestion of a bounded situation (Li and Thompson 1981:188). (59) illustrates:

(59) a. Wo e-le.
I hungry-LE.
I am hungry. (I'm getting very hungry)

b. Chenshan xiao-le san cun.
shirt small-LE 3 inch.
The shirt is too small by 3 inches.

Verb constellation patterns

a. Verbs with intrinsic features [Atelic] and [Durative] form Activities with their complements, if any. Verbs with the [Atelic] feature often have directional RVCs, e.g. *tui-lai* (push in this direction). They often have preverbal Locative complements:

(60) Zhangsan zai gongzuo wan.
Zhangsan at park play.
Zhangsan played in the park.

b. Constellations with [Telic] verbs and uncountable objects are Activities. The object NPs are unspecified: *gai fangzi* (build houses), *xie xin* (write letters).

Unspecified NPs appear as incorporated objects of verbs. The result is a compound that functions syntactically as a verb (Chao 1968: 415, Li and Thompson 1981:73). The syntactic direct object cannot be separated from the verb; in some cases separation is altogether impossible, in other cases it is limited. The compounds often have idiomatic meanings, e.g. *shui jiao* (sleep), *chang-ge* (sing).

c. Derived, multiple-event Activities represent shifted situations. The verb constellations denote sub-events of the ongoing event. Such Activities are common with Semelfactive constellations:

(61) Niao zai pai chibang.
bird ZAI flap wing.
The bird is flapping its wings.

Derived Activities also appear with telic verb constellations.

Syntactic properties

a. Activities have dynamic syntax.
b. They accept directional and flexible RVCs.
c. They are compatible with forms of simple duration. The obligatory verb-copying rule applies to post-verbal durative adverbials.
d. They allow durative adverbials and main verb *hua*.

11.3.4 Accomplishments

Accomplishments are durative telic situations consisting of a process and an associated outcome, e.g. *gai neige qiao* (build that bridge), *chuban zheiben shu* (publish this book). Some standard examples:

(62) a. Tamen chi-bao-le.
They ate-RVC-LE
They ate their fill.

b. Tamen zao-le yisuo fangzi.
they build oneCL house
They built a house.

c. Mali zou-qu-le xuexiao.
Mali walk-RVC-LE school.
Mali walked to school.

The result state of an Accomplishment is often indicated by an RVC. RVCs may contribute information to the verb constellation, sometimes altering the situation type radically. (63) illustrates:

(63) a. Ta ba liangge zi xie-cuo-le.
He BA twoCL character write-mistake (RVC)-LE.
He wrote two characters wrong.

b. Jiqi ya-duan tade shouzhi.
machine press-sever (RVC) heDE finger.
The machine crushed his finger.

c. Wo la-kai neishan damen.
I pull-open (RVC) that-CL gate.
I pulled open the gate.

The verb *xie* (write) is transitive and telic in the verb constellation of (63a); the RVC does not change situation type. In (63b-c) the situation types are telic, and determined by the Result RVCs. The RVCs have dual roles, contributing both to situation type and viewpoint.

Completion is an essential feature of Accomplishments, since they are telic. They allow either RVCs of strict completion (64a), or flexible RVCs (64b). The examples illustrate:

(64) a. Ta ba ta-de shenghu jingli xie-cheng le yi ben xiaoshuo.
he BA his life experience write-into LE oneCL novel.
He wrote a novel about his life.

b. Ta gang fei dao Xianggang.
he just fly RVC Hong Kong.
He flew to Hong Kong.

The first example illustrates the *ba*-construction. The construction is similar to the passive, with the semantic requirement that the underlying direct object be affected by the event.

Accomplishments do not require the occurrence of a strictly completive RVC to convey the notion of completion. The association of a verb constellation with the Accomplishment situation type directly conveys an event with the property of completion (Smith 1990).

There is a non-detachability entailment for Accomplishments. Examples that demonstrate this directly cannot be constructed for syntactic reasons. Sentences require completive RVCs to present completed situations unequivocally, and RVCs

are incompatible with the imperfective morphemes. The entailment can be shown indirectly with perfective and imperfective sentences. For every perfective Accomplishment sentence with a completive RVC, an associated imperfective sentence can be constructed. The expected entailment relation holds between these sentences, as in (65): if (a) is true at interval I then (b) is true at I.

(65) a. Zhangsan xie-wan-le yifeng xin.
Zhangsan write-RVC-LE oneCL letter.
Zhangsan wrote a letter.

b. Zhangsan zai xie yifeng xin.
Zhangsan PROG write oneCL letter.
Zhangsan was writing a letter.

These entailments are reasonable because the final endpoint is instantaneous in principle.

The adverb *chayidiar* (almost) has two readings in an Accomplishment sentence. The adverb pertains to either the process or the outcome, as indicated in the expanded translations of (66a).

(66) a. Shangexingqi Zhangsan chayidiar zao-le yidong fangzi.
last week Zhangsan almost build-LE oneCL building.
Last week Zhangsan almost built a building.

b. . . . but he didn't quite get to it (he almost began).
c. . . . but he didn't quite finish it (he almost finished).

In English as well as Mandarin the sentence is ambiguous because the syntax does not indicate the scope of the adverbial.

Completive RVCs in sentences with atelic verb constellations are derived inceptives, Accomplishments with a shifted interpretation. In (67), the subjects succeeded in beginning the activities.

(67) a. Ta tui-dao-le yi-liang che.
He push RVC-LE push oneCLcart.
He push-finish a cart.

b. Ta-men xinshang-cheng-le yichang dianying.
he-PL enjoy-RVC-LE oneCL movie.
They enjoy-finish a movie.

The RVCs suggest a certain difficulty in completing the events of pushing the cart, enjoying the movie. Stage-level statives may appear in similar sentences as shifted inchoatives. Shifted inceptives and inchoatives are Achievements when the events are instantaneous.

Verb constellation patterns
a. Accomplishment sentences must denote specific, countable situations, and require countable NPs (proper names, pronouns, nouns with classifiers), or NPs with specific readings. Since Mandarin nouns have specific and non-specific readings, the second requirement must be stated semantically.
b. Verbs that are [Telic], [Durative] form Accomplishments. They may be transitive or intransitive.
c. Verbs with the feature [Telic], [Durative] form Accomplishments with directional complements. For instance the verb *zou* (walk) is atelic; but the verb constellation in *Ta zou-guo neige gongyuan* (He walked to the park) is an Accomplishment.
d. Stage-level statives may appear in shifted inchoative sentences, e.g. *shou* (thin), *pang* (fat), *hong* (red) function as inchoatives.

Syntactic properties
a. Accomplishments have dynamic syntax.
b. They are compatible with strictly completive RVCs.
c. They appear with main verb *hua*.
d. They are ambiguous in sentences with *chayidiar* (almost).
e. They accept the *ba* construction if the event has an Affected Object.

11.3.5 Semelfactives

Semelfactives are instantaneous atelic events, for instance *ti* (kick), *da men* (knock at the door); (68) illustrates:

(68) Zhangsan kesou-le.
Zhangsan cough-LE.
Zhangsan coughed.

Semelfactives do not allow any of the grammatical concomitants of duration: neither the progressive *zai*, the resultative *zhe* (except in backgrounding contexts) nor lexical forms referring to duration. The temporal schema of a Semelfactive is simple, with only the single-stage event, as set out in Chapter 2.

Semelfactives accept agentives, e.g. adverbials, imperatives, and embedding below verbs such as *shofu* (persuade).

Verb constellation patterns
Verbs with the intrinsic features [Atelic] and [Instantaneous] form Semelfactive constellations together with their complements. Their arguments must be quantized.

Syntactic properties
a. Semelfactives have dynamic syntax.
b. They do not allow imperfective viewpoints or other durative forms.
c. They are incompatible with RVCs of strict completion.

11.3.6 Achievements

Achievements are instantaneous changes of state, typically with verbs such as ***da-po*** (break), *hui* (return), *zhaodao* (find); (69) illustrates:

(69) a. Zhangsan si-le.
Zhangsan die-LE.
Zhangsan died.

b. Wo peng-jian-le nide didi.
I meet-achieve-LE youDe brother.
I encountered your little brother.

Achievement do not allow the progressive *zai*. The temporal schema for this situation type consists only of a change of state.

Since the property of duration differentiates Accomplishments from Achievements, the durative main verb *hua* should discriminate between them. The expectation is borne out: *hua* does not appear with Achievement verb constellations, as (70) shows.

(70) a. *E-si hua-le ta sange yue.
die-of-hunger take-LE he 3CL month.

b. *Shui-zhao hua-le haizimen wufen zhong.
fall-asleep take-LE childPL 5CL minute.

Achievement sentences may appear with durative adverbials following the verb. The adverbials indicate the time that has elapsed since the change of state. Such sentences do not allow verb copying:

(71) a. Wo mingbai zheige wenti yige xiaoshi le.
I understand that CL question one hour PRT.
I have understood that question for an hour.

b. *Wo mingbai zheige wenti mingbai-le yige xiaoshi le.
I understand that CL question understand LE one hour PRT.
I have understood that question for an hour.

The restriction also holds for Accomplishments, as noted above.

Many Achievements appear in the *ba* construction when the object is affected.[10] The requirement of an affected object explains the difference between (72a) and (72b); the latter is ungrammatical:

(72) a. Ta ba zhimen ti-le yige dong.
He BA paperdoor kick-LE oneCL hole.
He kicked in the paper door.

b. *Lisi ba Zhangsan kanjian-le.
Lisi BA Zhangsan see-LE.
Lisi saw Zhangsan.

Accomplishments appear in this construction, as noted above. The resultative *-zhe* appears with some Achievement constellations.

Verb constellation patterns
a. Achievements must have specific or countable nominals.
b. Verbs with the intrinsic features [Telic] [Instantaneous] form Achievement constellations, together with their complements.
c. Verbs with the intrinsic feature [Atelic] form Achievements with directional complements: the verb *tiao* (jump) is atelic in minimal sentences, but in *Zuotian ta tiao-dao chuang-shang* (Yesterday she jumped onto the bed) the verb constellation is telic.
d. Stage-level statives may appear as inceptive Achievements, frequently signalled by the perfective *-le* and/or a sentence particle.

Syntactic properties
a. Achievements have dynamic syntax.
b. They are incompatible with the imperfective viewpoints.
c. They are compatible with RVCs of strict completion.
d. They are incompatible with main verb *hua*.

11.3.7 Statives

States are homogenous situations with no dynamics, e.g. *cunzai* (exist), *qian* (owe), *shuyu* (belong), *xiang* (resemble), etc. Verb constellations have stative verbs or attributive predicates; the examples illustrate:

(73) a. Meiyou kongqi ren jiu bu-keneng cunzai.
have-not air man then not-can exist.
One cannot exist without air.

b. Tamen zhidao-le shenme jiao kexue.
they know -LE what call science.
They have learnt what is called a science.

c. Mali hen gaoxing.
Mary very happy.
Mary is very happy.

Stative verbs may have directional and result RVCs, as shown in (74). The RVCs are idiosyncratic. In the negative stative construction known as the potential, completive RVCs occur with statives (74c):

(74) a. Bifen jie-jin.
score close-RVC.
The score is very close.

b. Dajia dou pa-si.
everyone all fear-RVC.
Everyone is scared to death.

c. Ta shui -bu-zhao.
He sleep-not-arrive.
He can't sleep.

Stative adjectival predicates must appear with the adverbial *hen* in simple sentences, as (75) illustrates:

(75) a. Mali hen gao.
Mali very tall.
Mali is tall.

b. Wuzi hen ganjing.
room very clean.
The room is clean.

Although it means *very* in other contexts, with adjectival predicates ***hen*** **merely** marks the construction. (I ignore 'complex statives' here.)

Stative predicates participate in a reduplicative process that turns a predicate into a manner adverbial. The pattern of reduplication is AABB, uniquely for statives. For instance, *ganjing* (clean) reduplicates as *gan-gan-jing-jing* (Chu 1983: 27). Not all statives allow reduplication: the possibilities must be stated for individual forms. Non-statives have an ABAB pattern of reduplication.

The standard viewpoint for Statives is the ø imperfective. In the presence of an explicit independent bound, statives may appear with the perfective morpheme ***-le***, as Li & Thompson point out (1981:188):

(76) Ta nianji bi wo da-le ji-shi sui.
S/he age compar I great-LE several-10 years.
S/he is older than I by a few decades.

See also (59), in which a bounded stative functions as an Activity. The classes of stage-level and individual-level statives have different distributions. Stage-level statives occur with the imperfective viewpoint *-zhe*, whereas individual-level statives do not. Only stage-level statives appear in inchoative sentences, e.g. *anjing* (quiet), *kechi* (polite). The distinction has at least one other correlate: only stage-level predicates allow the causative construction with *nong* (cause, make). Stage-level Statives are good in sentences with *nong: Ta ba dan nong-hong-le* (He made/dyed the egg

red), but individual-level statives are not: **Ta ba tade nan-har nong-yonggan-le* (He made his son brave), from Teng (1973:35). These distributional differences show that stage-level and individual-level stative predicates are covert grammatical categories in Mandarin.

Habituals and generics are stative, without morphological marking. Habituals may but need not have frequency adverbials.

(77) a. Ta pinchang mai hen duo shu.
he usually buy very many book.
He usually buys a lot of books.

b. Lisi he jiu.
Lisi drinks wine.
Lisi drinks wine.

Sentences like (77b) are indeterminate: they have both an ongoing and habitual interpretation. Either Lisi is engaged in drinking some wine, or he is a habitual wine-drinker.

Verb constellation patterns
a. Verb constellations have the intrinsic feature [State].
b. Adjectives and prepositional phrases are Stative. They usually appear in sentences without the copula.
c. Habituals may be formed from any situation type.

Syntactic properties
a. Statives have stative syntax: adjectival predicates with *hen*, reduplication with the AABB pattern. They do not appear with the features of dynamic syntax.
b. They accept the ø imperfective, the *-guo* perfective, and the *zhe* imperfective with stage-level predicates; with explicit bounds, they may appear with perfective *-le*.
c. They accept durative adverbials on a simple durative interpretation.

11.3.8 Verb constellations of special interest

Super-lexical morphemes
In Mandarin most super-lexical morphemes have the form of RVCs. There are fixed combinations of RVCs with the meanings *begin, continue, stop, finish.* These RVCs allow a sentence to focus part of a situation in the manner typical of super-lexical morpheme. They form shifted situation types from basic-level verb constellations.

The fixed combination of directional RVCs *qi-lai* (start, begin) focuses the beginning of a situation. (78) is a derived telic sentence:

(78) Zhangsan shuo-qi-lai.
Zhangsan talk-qilai.
Zhangsan began to talk.

Qilai is felicitous with verb constellations of the durative situation types. The resulting situation type is an Accomplishment or an Achievement, depending on whether the initial segment has duration.

The form *xia-qu* (continue) focuses the internal stages of a durataive situation, producing Activity sentences:

(79) a. Wo xie-xia-qu.
I write-XIA-QU.
I continued writing.

b. Zhangsan xia-qu.
Zhangsan cough XIA-QU.
Zhangsan continued to cough.

Semelfactive and Achievement constellations may be focused with *xia-qu* as derived, multiple-event Activities.

There are also main verbs that function as super-lexical morphemes: *ting* (stop), *wan* (finish, stop).

Position and location verbs
Verbs of position and location have a distinctive syntactic and semantic pattern, e.g., *zuo*(sit), *gua* (hang), *tang* (lie). They form Accomplishment verb constellations which denote the coming about of the position or location; they also appear as resultatives with the imperfective *-zhe*. The examples illustrate the two uses:

(80) a. Zhangsan qiang shang gua-le yifu hua.
Zhangsan wall on hang-LE oneCL picture.
Zhangsan hung a picture on the wall.

b. Qiang shang gua-zhe yifu hua.
wall on hang-ZHE oneCL picture.
A picture is hanging on the wall.

(81) a. Mali chuan yijian chenyi.
Mali put on oneCL shirt.
Mali is putting on a shirt.

b. Mali chuan-zhe chenyi.
Mali put on ZHE shirt.
Mali is wearing a shirt.

The difference between internal and resultative stages may require entirely different verbs in translation, as in (81b), from Teng 1973.

Notes

[1] The basic traditional Mandarin reference grammar in English is Chao 1968; a more recent functional approach is Li & Thompson 1981. Also useful are Teng 1975, Paris 1981. There is a growing literature on the aspectual system of Mandarin, which is of particular interest because of its complexity.

I would like to thank Jeannette Faurot for interesting discussions and invaluable help, and for careful reading of the manuscript. I thank Meng Yeh for many important comments and examples; and Jocelyn Liu, Li Ping, and Hai-hua Pan for helpful judgments and suggestions. I thank Huei-ling Lai for correcting many errors in the earlier edition of this Chapter; and Annie Yu for a careful final reading.

[2] Many examples in this chapter are taken from reference grammars or current texts. The constructed examples have been checked with speakers of the language.

[3] Yeh gives a different analysis, in which the change from the resultant state arises as an inference (1994:154-5).

[4] The handbook says of both forms that they should be used for an action in progress or a continuing state; no distinction is made between the two. According to T'ung and Pollard 1982, however, *-zhe* is now used as a general imperfective while *zai* has an archaic flavor. Perhaps because of the overlap between them, usages vary with individuals: thus for one resident of Shanghai it is a matter of lexical variation which imperfective morpheme appears with a given verb constellation.

A similar viewpoint is the Japanese imperfective *te iru*, which focuses both internal and external intervals (Jacobsen 1982, Smith & Weist 1987, Ogihara 1989).

[5] This analysis of stative sentences is presented in Smith 1994. It represents a change from an earlier account, in which statives were treated as LVM sentences with the neutral viewpoint. I now believe that since stative sentences cannot be taken as closed, they should not be analyzed as having the neutral viewpoint.

[6] The sentence particles express various functions involving speaker attitude and, frequently, a discourse context. According to Li & Thompson, "their semantic and pragmatic functions are elusive"; the main functions of the particles are listed as '*le*: Currently Relevant State,' '*ne*: Response to Expectation', '*ba*: Solicit Agreement', '*ou*: Friendly Warning', '*a/ya*: Reduce Forcefulness' (1981:238).

To give some idea of the range of interpretations these particles can have, I mention other views on two of them. Chao lists seven functions for sentential *le*: Inchoative, Command in Response to a New Situation, Progress in Story, Isolated Event in the Past (this one may refer to the perfective, post-verbal morpheme *-le*), Completed Action as of the Present, Consequent Clause to Indicate Situation, Obviousness, Particle of Lively Enumeration (1968:799-800). Chu is interested mainly in discourse. In discussing the particle *ne*, he notes that "it is continuative.. indicates the present utterance.. serves as a continuation from a previous portion of discourse or from a tacit understanding between speaker and hearer (1986: 101).

[7] There was a some disagreement among the subjects. Roughly twice as many people judged *-le* to be necessary as judged it to be optional, for most examples.

[8] These remarks about the imperfective can be generalized. Most languages have an imperfective viewpoint which requires anchoring of some kind. It is almost always possible to show that the dependence of the imperfective is not necessarily syntactic: one can usually construct a syntactically independent imperfective sentence which is dependent pragmatically on another sentence. See also the discussion of imperfectives in Chapter 4.

[9] For some speakers, especially those familiar with English, *nei* is a completive very like English *in*, as Haihua Pan has pointed out to me.

[10] The *ba* construction has been extensively discussed, especially in the Mandarin literature. There are restrictions on the properties of the object. Cheung 1973 presents a useful summary of basic ideas about the construction; see also Li 1974, Chao 1968, Li & Thompson 1981.

CHAPTER 12

THE ASPECTUAL SYSTEM OF NAVAJO

12.1 Introductory characterization

12.1.1 The Navajo aspectual system

The Navajo language is unfamiliar and its grammar is notoriously complex. The intricate Navajo lexicalization, and a set of formally marked verbal categories, are important features of the language. In developing this analysis I have been interested in the answers to three questions. The first two are based on the grammatical pattern of the language, and must impose themselves on everyone who investigates its aspectual system. What is the function of the Navajo pattern of verb lexicalization? What is the semantic role of the verb lexeme categories? The third question arises in the two-component theory to which I am committed: What are the situation types of Navajo, and how do they relate to the Aristotelian set of situation type categories? I will offer answers to these questions, giving the main outlines of the aspectual system and suggesting directions for research.[1,2]

The viewpoints of Navajo are perfective, imperfective, progressive, and neutral. The overt viewpoints appear in non-stative sentences; the progressive is quite limited in distribution. The imperfective viewpoints and the feature of duration are closely associated by powerful distributional and pragmatic constraints.

Navajo has three situation types that function as covert categories in the language: States, Durative events, Instantaneous events. The features of dynamism and duration are salient. The distinction between telic and atelic is not grammaticized in Navajo. There is a pattern of multiple lexicalization which in effect neutralizes the feature of telicity for durative events. Navajo has a highly articulated set of super-lexical forms

with narrow focus on the endpoints or internal stages of an event. Duratives tend to have verb bases that focus their endpoints. Since the endpoints of an event are telic events in themselves, all have a telic feature. Verb bases are quite precise in their aspectual value: there is little surface indeterminacy.

Event verb bases are organized by morphological categories which I call verb lexeme categories (VLC).With VLCs, there is a second closed system in the aspectual component. The choices within this system are grammatically constrained. The distribution and conventions for a given verb base depend partly on VLCs.

The language has few of the adverbial and verbal contrasts which distinguish situation types in other languages. The theory of situation types leads to the prediction of certain distributional contrasts which are quite unexpected within the VLC pattern. There are such contrasts: they are due to covert situation types in the language which overlap in distribution with the overt VLCs.

12.1.2 Preliminaries: The Navajo verb

The Verb Composite: In Navajo the verb composite contains most of the grammatical information in a sentence. The verb has an intricate structure, built up in layers with an abstract verb root as the basis of the whole. There is no surface form that corresponds directly to the verb in languages like English and French. The verb composite consists of a verbal unit with a series of prefixes and other forms; the prefixes have fixed hierarchical and sequential positions.

Four levels of the verb composite can be distinguished.[3] The first is the verb theme, which contains the verb root, classifier, and certain tightly bound thematic elements. At the next level is the verb base: the base consists of the theme alone, or the theme and adverbial prefixes. These prefixes express lexical and adverbial concepts, including plurality. In the verb base the theme is realized concretely as a set of stems; each stem is associated with one of the Mode forms. At the third level are the pronominal prefixes, which are hierarchically outside the verb base. The pronominal prefixes indicate the subject and other arguments, if any. At the fourth level, the conjugational prefix indicates viewpoint or other Mode. The verb structure is this:

(1) Hierarchical structure of the Navajo verb
Verb Theme: $_{\text{Theme}}$[classifiers [root]]
Verb Base: $_{\text{Base}}$[adverbial prefixes . . . [Theme]]
Verb Constellation: $_{\text{VConst}}$[Pronoun prefixes [Base]]
Verb Composite: $_{\text{VComp}}$[Conjugational prefixes [V Const]]

The modes are associated with distinct stem shapes, and may have other markers in addition to the conjugational prefixes. (2) gives a verb composite and its analysis according to the scheme above; the prefixes are "adv" (adverbial), "conj" (conjugational), "subj" (subject), "class" (classifier). The raised comma indicates a glottal stop (ʼ), the diacritic slash indicates a high tone (ó), the hook indicates nasalization (ǫ).

(2) na'ashkóó'. (I swim around.)
na - 'a - ø - sh - ɬ - kǫ́ǫ́'
1 2 3 4 5
adv+pref + conj+subj+ classif + stem
around$^{\text{impf}}$ I swim
verb base: [na . . . ɬkǫ́ǫ́'] (swim around)

The verb base is cited with the stem shape of the imperfective viewpoint; I will generally present verb bases in this way.[4] The linear order of the prefixes does not correspond to their hierarchical order. I will assume that the verb composite is derived by adding affixes in hierarchical rather than linear order, following Speas (1986:228). The superscripts indicate that the verb composite has the imperfective viewpoint and a base of the Continuative verb lexeme category.

The verb base is as close as one gets in Navajo to the verb as a separate unit of meaning. "The verb base constitutes the skeleton of a lexical form—one in which lexical meaning is apparent, but which still lacks essential markers" (Young & Morgan (henceforth Y&M) 1987:140). The base is complex. Many bases contain adverbial prefixes that function like syntactic complements, adding information and possibly changing situation type. For certain categories the conjugational prefix may determine situation type. In discussing situation types I refer to the verb base, the verb composite, or the sentence.

The viewpoint aspect of a sentence is signalled by one of three Modes, the Perfective, Imperfective, and Progressive. There are four other Modes which contrast with the viewpoints: the Usitative or Customary, the Iterative, the Future and the Optative. Sentences with these Modes have the Neutral viewpoint. Every sentence of Navajo must have a single Mode morpheme; Mode is expressed by a conjugational prefix (including ø) and a distinctive stem.

Verb Lexeme Categories: Verb bases in Navajo have a set of discontinuous categories that contribute to semantic meaning. The categories vary in semantic consistency: some have a consistent, identifiable meaning and others do not. Since they affect the meaning of a verbal base, the categories often affect situation type. These discontinuous morphemes are known as 'aspectual categories' in Navajo and other Athabaskan languages. In order to avoid confusion between different notions of aspect, I will use the term Verb Lexeme Category (VLCs) for them. VLCs are formal categories; they are obligatory for non-statives and they affect the co-occurrence possibilities of the verb base.

The VLCs fall into two groups, A and B, on distributional grounds. The distributional facts are relevant for discussion of both viewpoint and situation type, so I summarize them here. The VLCs of Type A are limited in distribution: they are compatible with the imperfective only in limited contexts, and with only one class of durative adverbials. In contrast, the VLCs of Type B are freely compatible with the imperfective viewpoint, and with all durative verbs and adverbials. There is some correlation with the semantic and covert category feature of durativity: all VLCs of Type B are durative; some VLCs of Type A are durative; see section 12.5.

The surface forms of Navajo are produced by an intricate set of rules which change the shape of prefixes as they combine. For instance, the prefixes *di+yi+sh* > *deesh*; *di + yi + ø* > *doo*. (3) presents one example in detail; (a) gives the surface form, (b) the breakdown of that form into prefixes and stem, (c) information about the prefixes.

(3) a. neídį́h. (He eats it regularly.)[Iter B:Dur]
b. ná + (yi) + ø + ø + d + (y)į́h
c. iter + obj + conj + subj + classif + stem

Since the surface forms are quite opaque, and the rules to derive them often fiendishly complex, I omit phonological analysis; see the references in note 1. Instead I give in superscript the information needed here: viewpoint or Mode, and VLC, as in (3a). Thus the form in (3a), *neíd į́h*, has the Iterative Mode and the Type B Durative VLC. Following Y&M 1987 I use first person imperfective as the basic citation form, with infinitive translation; imperfectives are given as present progressives, perfectives and neuters as perfectives. The translations are approximate.

12.2 Viewpoint aspect

Navajo offers contrasting Perfective and Imperfective, or closed and open, viewpoints for non-stative verb bases. A slightly different imperfective, the Progressive, is available for one type of event base. Distributional constraints and conventions of use limit imperfectives with verb bases of Type A VLCs. Considering these limitations, the formal symmetry of perfective and imperfective is somewhat misleading. I discuss the conventions after presenting the distributional facts. I will assume that Navajo has two non-stative situation types, the Durative and the Instantaneous; the analysis is presented in section 12.3.

The Neutral viewpoint is obligatory for stative sentences and for sentences with the non-viewpoint Modes: the Usitative, Iterative, Future, and Optative. These Modes contrast with the viewpoint morphemes, so that they have the Neutral viewpoint by default. Stative verb bases have non-contrastive viewpoint morphemes with the value of the neutral viewpoint.

The Modes are signalled by conjugational morphemes in Position 7 of the verb composite and by dependent, related prefixes and stem shapes. (4) illustrates two contrasting Modes for one verb Base; (5) gives a full set of Mode forms for another base:

(4) 'íníshta'. (I am counting, reading—going to school.)[Impf]
'iłta'. (I went to school.)[Perf]
'íídééshtah. (I will go to school.)[Fut]

(5) naashzheeh (I am hunting)[Impf]; ninášhzhah (I often/repeatedly go hunting)[Usit, Iter]; nishiszhee' (I went hunting and returned)[Perf]; ndeeshzhah (I will go hunting)[Fut]; naoshzheeh (that I might go hunting)[Opt]

As the examples show, Mode contrasts produce different surface forms; in most cases a change in Mode triggers a difference in stem shape as well as Mode prefix.

The perfective and imperfective are each indicated by one of four conjugational morphemes: *ni, yi, si, ø*. There is some debate in the literature as to the semantic significance of these morphemes.[5] The facts are complex. Several dependencies hold between certain prefixes, VLCs, and viewpoint morphemes. With the *si* perfective, for instance, Distributive and Diversative VLCs are obligatory. The plural morpheme ***da*** overrides other dependencies and always appears with the *si* perfective. This suggests that *si* is related to plurality. But another multiple VLC, the Repetitive, takes either ***si*** or *yi*, depending on the particular verb base. Further, VLCs not associated with plurality also take *si*, namely the Continuative, the Conclusive, and the Reversative. I conclude that there are some semantic regularities at the prefix level, but that it is difficult to find a single property that characterizes a viewpoint morpheme in all of its appearances.

12.2.1 The Perfective Viewpoint

The perfective viewpoint is available for event verb constellations. The perfective presents closed events, that is, events with initial and final endpoints. The perfective viewpoint presents events as complete and with a point-like representation, whether or not they actually have duration in the world. The notion of punctuality is discussed in Chapter 4. The perfective contrasts with the imperfective, and in some cases with the progressive. The examples illustrate the perfective viewpoint for sentences of different VLC and situation type:

(6) a. níya.
I arrived.[PerfA:Mom] (Instantaneous)

b. shéch'id.
I gave it a single scratch.[PerfA:Sem] (Instantaneous)

c. hooghan binishishnish.
I did some work on a hogan.[PerfB:Cont] (Durative)

d. hoséłbį'.
I built a hogan.[PerfB:Concl] (Durative)

As the translations indicate, (6c,d) differ in the semantic feature of telicity; the perfective interpretations differ accordingly. (6c) denotes a terminated atelic event; the event of (6d) is telic and the perfective conveys that it is completed.

Since the perfective in Navajo spans the endpoints of a situation, sentences with this viewpoint cannot felicitously be conjoined with assertions that the events continue. (7) illustrates: it is odd in both Navajo and English.

(7) # hoséłbį' dóó t'ahdii hashbį'.
I built a hogan[Perf] and I'm still building it.[Impf]

This is typical of the perfective viewpoint.

There is some interaction between perfective viewpoint and VLC category. The Progressive viewpoint requires verb bases with the Cursive VLC; the Continuative VLC has a special interpretation with the perfective viewpoint (section 12.5.2).

The semantic value of the Navajo perfective is presented schematically below. *I* and *F* indicate the initial and final endpoints of durative events, *E* indicates the single stage of instantaneous events.

(8) Temporal schema for the Perfective
I F/E
////////

The requirement of initial and final endpoints automatically prevents the viewpoint from applying to Statives, since that situation type has no endpoints.

12.2.2 The Imperfective Viewpoint

The imperfective presents an interval of an event which includes neither its initial nor final endpoint. This viewpoint applies naturally to durative situations, since they have internal intervals which meet the conditions for the viewpoint, as in (9):

(9) a. yishcha.
I'm crying.[ImpfB:Dur]

b. hashbį́'.
I'm building a hogan.[ImpfB:Concl]

c. niishgáá́h.
I'm heating it.[ImpfA:Trans]

d. shoo, naghá́í tsé bitł'áá́hdę́ę́' tł'iish ch'é'néé́h.
Look, there's a snake crawling out from under that rock.[ImpfA:Mom]

Note that the examples have verb bases of Type A and Type B VLCs.

Since the Imperfective presents an event without endpoints, it is compatible with an assertion that the event continues, as (10) shows:

(10) 'áníídí yee' yidloh dóó t'ahdii yidloh.
A few minutes ago he was laughing and he is still laughing.[ImpfB:Curs]

The felicity of this conjunction contrasts with (7) above, in which the perfective viewpoint appears in the first conjunct.

The imperfective viewpoint may focus the preliminary stages of an event, depending on situation type and context. Instantaneous verb bases require this focus, since have no internal stages. (11) illustrates:

(11) a. dah diisháá́hgo . . . .
I was leaving (when . . .).[ImpfA:Mom] (Instantaneous)

b. (k'adę́ę́) 'iishhá́á́sh.
I'm on the verge of falling asleep.[ImpfA:Mom] (Instantaneous)

The imperfective may also focus preliminary planning stages of Durative events, with the morpheme *k'adę́ę́* (about to):

(12) a. tsíłłgo—k'adę́ę́ 'ashghał.
Hurry—I'm ready (about to) to eat meat.[ImpfA:Dur] (Durative)

b. shidibé k'adę́ę́ da'adlá.
The sheep are about to drink.[ImpfB:Dur] (Durative)

The contexts in which imperfectives of Type A VLCs can appear are conventionally limited, including adversative and backgrounding contexts (see 12.2.5).

Formally, the imperfective schema indicates an interval that does not include the endpoint(s) of an event. The situation type schema to which applies indicates a single or final endpoint. This allows for internal or preliminary focus and excludes resultative focus, which does not occur in Navajo.

(13) Schema for the imperfective viewpoint
. . . . . *F/E*
/////

The temporal schemata of the situation types will automatically make the distinction between internal intervals for durative events and preliminary intervals for instantaneous events. The use of the imperfective for preliminaries of durative situation types is not provided for here; it requires a special provision that *k'adę́ę́* be present for duratives with preliminary focus.

12.2.3 The Progressive Viewpoint

The Progressive viewpoint presents an internal segment of a durative event. It is limited to verb bases of the Cursive VLC, as in (14):

(14) a. 'atiingóó yisháá́ł.
I'm walking along the road.[Prog B:Curs]

b. hooghangóó yish'nah.
I'm crawling along toward the house.[Prog B:Curs]

c. yish'ah.
I'm in the process of butchering (obj).[Prog B:Curs]

The Cursive realizes verb bases of motion or locomotion (14a-b). But it is not limited to such bases: there are many like (14c) as well. The Cursive category is varied, as the following indicates: *ʼanool'ąął* (the level of flood water is moving along), *dah yiibah* (camping while on a raid), *nááshbał* (whirling around rapidly), *béésdzil* (strain at, e.g. childbirth, pulling a heavy object), *yishgoł* (digging or spading along in a line), *yishgish* (cutting along in a line), *yishtl'óół* (weaving along). These events involve motion only in a very extended sense.

The progressive focuses only the internal stages of events, unlike the imperfective. (15) illustrates with a contrasting pair:

(15) a. 'awée' tsásk'eh yikáá'dóó adah yigoh.
The baby is in the process of falling from the bed.[ProgB:Curs]

b. 'awée' tsásk'eh yikáá'dóó adah 'iigeeh.
The baby is about to fall off the bed.[ImpfA:Mom]

(15a) cannot be taken as referring to a preliminary stage, before a fall actually occurs. In contrast, this is the preferred reading of (15b), as Midgette notes (1987:86).

The Progressive has connotations of activity and events in progress, as is typical of the progressive. In narratives it also functions to establish an internal perspective (Midgette 1987:125).

The temporal schema of the Navajo progressive is presented in (16). The schema provides that the viewpoint focus only internal intervals of durative events with verb bases of the Cursive VLC.

(16) Temporal schema of the Progressive
I . . . . . F[Cursive]
//////

The temporal schema of this viewpoint is similar to that of progressives generally, except for its limitation to verb bases of the Cursive VLC; Chapter 4.

12.2.4 The Neutral Viewpoint

The Neutral viewpoint presents part of a situation, giving enough information for an open or a closed interpretation. The neutral viewpoint is a default that arises for sentences that lack a viewpoint morpheme (LVM sentences). In Navajo, LVM sentences occur with Stative verb bases, and with the Usitative, the Iterative, the Future and Optative Modes. They contrast with the Modes expressing viewpoints.

The Neutral viewpoint includes the initial endpoint and at least one internal stage of a durative event. This partial information is flexible enough to account for the interpretations that arise; see Chapter 4. The open interpretation includes the initial endpoint, unlike the imperfective. The closed interpretation is due to the inference of a final endpoint. Neutral viewpoint sentences can be felicitously conjoined with assertions that the situation no longer obtains, and with assertions that it continues. The examples illustrate with stative verb bases, which have neither overt viewpoint nor VLC:

(17) a. haidą́ą́' dá'ák'eh shee hóloǫ́ ńt'éé'.
Last year I had the farm but I don't (have it) anymore.

b. 'adą́ą́dą́ą́' tsinyaagi sédáá ńt'éé' dóó t'ahdii biyaagi' séda.
I was sitting under a tree yesterday and I'm still sitting under it.

Similar examples can be constructed for sentences with the Usitative and other nonviewpoint Modes.

Other evidence for the flexibility of the Neutral viewpoint comes from sentences that express temporal relations between situations. Open viewpoints allow for overlapping or simultaneous events; closed viewpoints allow the reading that events are in sequence. Sentences with the Neutral viewpoint have both interpretations, as in (18). The structure has a main and embedded clause; *-go* is a subordinator:

(18) a. dibé nanishka'go hataał.
When I herd sheep, he sings.[Usit, Iter]

b. dibé nanishkaadgo hataał dooleeł.
When I herd sheep, he will sing.[Fut, Fut]

c. shizhé'é doogáał indago, da'diid[i]ł.
When my father comes, then we'll eat.[Fut, Fut]

d. hastiin ná'ádl[i]hgo, ch'ínáshdááh
When my husband drinks, I leave.[Iter, Usit]

The relations between events in these sentences can be taken as simultaneous, sequential, and overlapping, depending on situation type and plausibility. We are looking for final endpoint information in these examples: initial endpoint focus is impossible in Navajo without a specific prefix. Examples (18a-b) present durative events, probably simultaneous; (18c) presents instantaneous events with a sequential interpretation; (18d) presents a durative and instantaneous event, naturally taken as overlapping. Temporally related events are discussed in more detail in section 12.5.2.

Although flexible, the Neutral viewpoint has some limitations. It cannot present the preliminary stages of an event, as (19) illustrates:

(19) 'awée' tsásk'eh yikáá'dóó adah yigoh.
The baby is in the process of falling off the bed.[FutA:Mom]

The translation gives the only possible interpretation: the sentence does not mean that the baby is about to fall off the bed. To convey a future-oriented sentence with preliminary focus, one uses the imperfective and a future adverbial. The Future tense is generally reserved for the relatively remote future.

The block on preliminary focus is predicted in the general account of the Neutral viewpoint. The viewpoint allows only a focus within the temporal schema of a situation, so that neither preliminary nor resultative focus occurs. The Neutral viewpoint

of Navajo conforms to the temporal schema of Chapter 4, which includes the initial endpoint and one internal stage of a (durative) event.

12.2.5 Conventions of Use

I discuss several conventions for the use and interpretation of the viewpoints in Navajo. There are co-occurrence restrictions on the imperfective viewpoint, striking uses of the viewpoints to convey inferences about event continuation, and inferences from viewpoints about temporal location. These conventions underlie some of the strongest patterns of the language.

The imperfective viewpoints are related to durativity, which is associated with VLCs of Type B. There are constraints on the imperfective, both grammatical and pragmatic in nature. They are grammatical because they concern the overt categories of viewpoint and VLC. They are pragmatic because they are context-oriented and involve a disparate group of syntactic structures.

Duration: Verbs and adverbials of direct duration require the imperfective viewpoints (imperfective or progressive) and VLCs of Type B; section 12.5.

Adversative contexts: Imperfectives are required in adversative contexts which indirectly involve duration. Adversative contexts imply opposition to an expectation of some kind, and have a contrastive and negative flavor. 'Adversative' means "opposition, contrariety, or antithesis" according to the Oxford English Dictionary. The term is used in traditional English grammar to characterize conjunctions such as *but* and *or*. Adversative contexts are quite varied, both syntactically and semantically. In one type, an event is presented with the suggestion that it will stop before completion, or never actually occur. The negative feature is more subtle in another type: what is negated is an expectation of some kind. These contexts are sometimes called 'negative'. The main adversative contexts relevant to the Navajo imperfective are listed in (21).

(21) Adversative contexts
- a. Negative imperatives: t'áadoo -í-: Stop Xing
- b. Durative denial: doo + Verb + -í-: I'm not Xing
- c. Negative backgrounding: k'adę́ę + Verb
  Just as X, Y (so X stopped or didn't happen)
- d. Adversative conjunction: S ńt'éé' Y
  X but Y (so X stopped or didn't happen)

The examples in (22) are of types (c) and (d); they strongly imply that the event presented imperfectively did not begin or did not continue:

(22) a. k'adę́ę dah diisháahgo nikihoníłtą́.
Just as I was about to leave it started to rain.[ImpfA, PerfA]

b. sh{{dáą́' ashtł'ó ńt'éé' shi'niitsą́.
Last summer I was weaving but I got sick.[ImpfA, PerfA]

In (22a) the receiver infers that the rain prevented my leaving; (22b) suggests that the speaker did not finish weaving because of sickness. The notion of an adversative requires only that an expectation of some kind is contradicted. (22a) assumes tacitly that rain would normally prevent one from leaving.

Adversative contexts also allow continuations in which the event does occcur. For instance, standardly people leave their houses without taking a raincoat. (23) contradicts this expectation:

(23) k'adę́ę dah diisháahgo nikihoníłtą́ ako 'éé'tóhí biih yíyáago ch'íníyá.
As I was about to leave it started to rain, so I got into my raincoat and left.[ImpfA, PerfA]

The event of leaving took place, but with an accompanying event (the taking of the raincoat) that does not standardly occur.

This abstract notion of adversative is needed to explain other linguistic phenomena. For instance, contrastive accent and certain additional intonational features are appropriate in a range of situations and contexts. The contexts share a contrastive element or expectation which is not necessarily explicit in all contexts.[6] The idea is clear, but it cannot be adequately specified in syntactic terms because the potential variety of realizations is not finite.

The imperfective viewpoint also appears with Type A VLCs in backgrounding contexts. In Navajo backgrounded events are often presented with the *-go* subordinating conjunction and the imperfective viewpoint. All VLCs are acceptable in this context. For instance:

(24) a. góhwéé́h niishdóohgo awéé' tsásk'eh yikáá'dóó adah íígo'.
While I was heating the coffee the baby fell off the bed.[ImpfA, PerfA]

b. 'awéé'˝ tsásk'eh yikáá'dóó adah deezgo'go háácha.
As the baby started to fall off the bed, it cried out.[ImpfA, PerfA]

The subordinated clauses of these examples differ in situation type: (24a) is durative, (24b)instantaneous. The fact that such sentences are good shows that the general restriction on imperfectives of Type A VLCs is pragmatic rather than grammatical.

Imperfectives of verb bases with Type A VLCs may occur in single verb bases that have no Type B forms (section 12.3.2).

The former statements are exceptions to a general pragmatic constraint against the use of the imperfective viewpoint with Type A VLCs in simple sentences, and in neutral contexts generally. (25) is identical to the first clause of (22b); but it is ungrammatical for some speakers when it occurs in isolation (Midgette, p.c.).

(25) *diyógí yishtł'ó.
Rug I weave it.[ImpfA]

(25) presents the imperfective of a Type A verb base without an appropriate adversative context.

Although imperfective forms are available for Type A VLCs, they are used in marked and limited contexts. The constraint against imperfectives of verb bases with Type A VLC is strong in the consciousness of Navajo speakers. In fact, people are sometimes unable to give the imperfective forms of Type A VLCs, yet produce the forms naturally in contexts that trigger them (Midgette, p.c.). These examples illustrate the powerful patterns associating the imperfective viewpoint with durativity and Type B VLCs.

I now turn to two interesting conventions for the viewpoints of Navajo. These conventions complement, by circumvention, the patterns discussed above. Strikingly, the imperfective is often used to talk about situations that are actually closed, whereas the perfective is often used to talk about situations that are actually open.

In presenting a situation in progress speakers often use the perfective viewpoint. Thus one of the most idiomatic ways to say you are in the midst of doing something is to use the perfective form of an inceptive, as in (26):

(26) a. 'ółta'góó déyaʔ
To school I begin-to-go.[PerfA:Mom]
I'm in a state of having started to go. (= I'm on the way)

b. bi'niiłgaii.
I finished starting to heat it = I'm heating it.[PerfA:Mom]

The inference commonly made for such sentences is that the speaker is now in the process of going, or heating. Since it is an inference, it can be cancelled by explicit information to the contrary (...but I didn't actually go). Sentences like this can also mean that the speaker is definitely planning to go. Here the perfective viewpoint is used to present a situation in progress, perhaps because the imperfective is pre-empted by its association with duration.

To talk about situations that are closed one often uses the imperfective viewpoint, especially if one wishes to focus on temporal duration. For instance, Midgette reports that sentences like (27) are preferred for talking about the length of a journey (1987:100):

(27) a. shiidą́ą́'dii na'nízhozhígóó shił 'oolwoł.
for a long time I was driving toward Gallup.[ProgB:Curs]
It took me a long time to get to Gallup.

b. jį́į́dą́ą́' shá bíighah na'nízhoozhígóó shił oolwoł.
all day toward Gallup with me vehicle was going.[ProgB:Curs]
It took me all day to get to Gallup.

This convention associates imperfective viewpoints and duration.

The aspectual viewpoints often pragmatically indicate the temporal location of a sentence. Navajo has only one tense, the Future, and adverbials of temporal location are optional. But the viewpoints are pragmatically informative. The imperfective viewpoints are taken to refer to the Present time, unless there is explicit information

or a particular context to the contrary. The perfective viewpoint is taken to refer to the Past, again unless adverbials or context suggest otherwise. As noted in Chapter 11, the same conventions hold for Mandarin.

12.3 Situation aspect

Three situation types function as covert categories in the grammar of Navajo: Statives, Durative events, and Instantaneous events. Arrays of verb bases typically realize the Durative situation type. I assume that the situation type component of Navajo conforms to the account of Chapters 2 and 3: crucially, the temporal schema for an idealized situation type includes the situation in its entirety.

The notion of an array preserves the generality of the situation types across languages. This is a desirable result. Methodologically, a general account of aspectual systems is the strongest and therefore the most interesting account. Empirically, the aspectual system of Navajo is otherwise much like that of the other languages studied. The approach of Universal Grammar requires that we deal seriously with differenes in language structures.

12.3.1 The Navajo sentence

In this section I give some facts about Navajo nominals and verb base lexicalization. The basic order of the sentence is SOV; the language is postpositional. Nominal arguments are optional and appear to the left in a Navajo sentence. Both sentences of (28) are grammatical.

(28) a. ashkii łéęchąą'į́ yiyiiłtsą́.
boy dog he-saw-him.[PerfA:Mom]
The boy saw the dog.

b. yiyiiłtsą́.
He saw him.[PerfA:Mom]

Navajo nouns are not inflected for number or definiteness. These distinctions are made by the pronominal prefixes that obligatorily appear in the verb composite. The pronominals code singular, dual, and plural; definite and indefinite. Plural pronominals may refer to a specified or unspecified quantity.

Countability in nominals is not formally marked, although forms for specificity are available. (29a) is ambiguous, while (29b-c) are not:

(29) a. bilasáana yisháą́.
I'm eating apples/some apples/ an apple/the apple/the apples.[ImpfB:Dur]

b. bilasáana ła' yisháą́.
I'm eating an apple.[ImpfB:Dur]

c. bilasáana ła' yishdeeł.
I'm eating some apples.[ImpfB:Rep]

Multiplicity is an important notion in Navajo. There are three VLCs which usually denote a multiple event: the Repetitive, Diversative, and Distributive categories. There is a distinct Mode for multiple events, the Iterative. There is also a sub-lexical prefix, the seriative, which can indicate a multiple event (section 12.4).

Navajo has a distinctive pattern of lexicalization: there is a many-to-one relation between a durative verb base and an idealized situation type. Durative events are lexicalized with an array of related verb bases, rather than a single base. Typically an idealized event has a set of related verb bases which focus the event in complementary ways. The verb bases take different views of the event. (30) illustrates. The narrow views focus endpoints or internal stages (30a-d); there is also a broad view presents an entire round-trip event (30e):

(30) a. tsinaa'eełgóó niki'nítkǫ́ǫ́'.
I started to swim to the boat.[PerfA:Mom]

b. tsinaa'eełdi 'anítkǫ́ǫ́'.
I arrived swimming at the boat.[PerfA:Mom]

c. tsinaa'eelgóó 'eeshkǫ́ǫ́ł.
I'm swimming toward the boat.[Prog B: Curs]

d. tsinaa'eełgóó 'anítkǫ́ǫ́'.
He swam away to the boat (= came here swimming).[PerfA:Mom]

e. tsinaa'eełgǫ́ǫ́ ni'sétkǫ́ǫ́'.
I swam to the boat and back (= go there & back swimming).[PerfB:Cont]

Verb bases that present a narrow view of an event have super-lexical morphemes. There are inceptive and terminative prefixes in the Type A bases. The Cursive, of Type B, functions as a super-lexical morpheme that focuses internal stages. This array has no verb base with a simple broad view, realizing the one-way event.

The following arrays have broad and narrow view verb bases:

(31) a. nísétł'ah. (I skinned it)[PerfB:Dur]
b. détł'ah. (I started to skin it)[PerfA:Mom]
c. ńdí'nítł'ah. (I just got a good start skinning it, when . . . .)[PerfA:Mom]
d. yish'ah. (I am in the process of skinning it)[ProgB:Curs]

(32) a. bilasáana yishą́. (I'm eating the apple.)[ImpfB:Dur]
b. bilasáana bi'niiyą́ą́'. (I started to eat the apple.)[PerfA:Mom]
c. bilasáana niníyą́ą́'. (I finished eating the apple.)[PerfA:Mom]

(33) a. astsid. (I'm hammering.)[ImpfB:Rep]
b. bi'niitseed. (I started to hammer it.)[PerfA:Mom]

These verb bases belong to the class of non-motion verb bases. The whole-part multiple pattern is typical of this class.[7] Arrays like this are available for many, many cases.

Arrays consist of related verb bases. To make the notion precise, we require that bases of an array have the same content morphemes, differing only in super-lexical morphemes. This requirement allows us to distinguish array-related bases from other related verb bases. There are many bases with the same theme and different lexical morphemes: they are not related in the intended sense. (34) illustrates different relations between bases; they all have the same stem:

(34) a. yishdloh. (I'm laughing.)[ProgB:Curs]
b. ninídlo'. (I stopped laughing.)[PerfA:Mom]
c. 'eeshdlo'. (I laughed myself to death, had a good laugh)[PerfA:Mom]

The first two bases belong to one array. They differ only in super-lexical morphemes: (34a) has the cessative prefix *ni* (stop); (34b) has the Cursive VLC, focusing an internal interval. But (34c) belongs to a different array: the lexical morpheme (prefix 'a) adds content to the base and changes the particular quality of the event.

These examples suggest that relatively full arrays are usually available for durative bases. But not all duratives are realized by an array. There are single verb bases of durative events, as in (35):

(35) a. Shidá'ák'eh binaagóó béésh 'adishahí nísełt'i'.
I put a barbed wire fence around my field.[PerfA:Rev]

b. bighá'níshgééd.
I'm tunneling though it (a mountain). [ImpfA:Mom]

The verb bases in (35) run counter to the pattern of the language. The formal constraints on duratives apply to such single bases. They occur with semantically-based durative expressions, however. I will refer to single bases of durative events as 'minimal arrays'. See section 12.3.

Arrays vary a great deal. Inceptives verb bases are more frequent than cessative bases. The language has a large number of extremely specific Type A verb bases and a much smaller number of Type B bases. The correlation between number and specificity is strikingly consistent. By the criterion for an array given above, the possible arrays are inevitably limited: many Type A bases have no Type B counterparts and do not belong to an array.

The notion of "hunt" is realized with the root [zhee'], for instance. The root has 16 Type A bases and 4 Type B bases.[8] The Type A bases include ['a . . . zhéé́h] (go away hunting), ['ahéé . . . zhéé́h] (make a circuit hunting), ['ałnáá . . . zhéé́h] (to hunt between two places), ['ałts'á . . . zhéé́h] (separate while hunting), [ch'í . . .

zhéęh] (go out horizontally while hunting), [ha´. . . zhéęh] (climb up hunting), [hádí . . . zhéęh] (be on the way, start on the way). The Type B bases: [íka´. . . zhéęh] (go hunting for), [há . . . zhéęh] (go hunting, be out hunting), [na´. . . zheeh] (be hunting], [yí . . . zhah] (go along hunting).

The Type B bases are quite general. Here and elsewhere, they can be used as counterparts to the specific Type A bases. To talk about the internal stages of an event that has only a specific Type A base, the speaker may use a general Type B base. This pattern of use extends the array phenomenon; it is particularly common with bases of motion.

The array is typical of durative verb bases. Neither Instantaneous event verb bases, nor Statives, are lexicalized in arrays.

12.3.2 Temporal properties in Navajo

Situation types are covert grammatical categories which have distinctive distributional patterns, the correlates of semantic temporal features. The temporal feature of the Navajo situation types are dynamism and duration.

The syntactic properties of dynamism are salient. Event verb bases have VLCs, and may appear with pro-verbs; event verb composites allow contrasting viewpoints. These properties constitute dynamic syntax in Navajo.

Duration is also salient, with four grammatical correlates: co-occurrence of a verb base with forms of direct duration; co-occurrence with forms of indirect duration; focus of the imperfective viewpoint; interpretation of super-lexical inceptives and cessatives (egressive). Together, these properties differentiate verb bases according to the semantic features [Durative] or [Instantaneous].

There is a relation between VLC and the semantic feature of duration. All bases of Group B, and some bases of Group A, are durative. Direct durative verbs and adverbials are morphologically based, and appear only with Group B VLCs. But indirect duratives appear with semantically durative bases of Group A and Group B. They are discussed in sections 12.3.3 and 12.5.2.

The imperfective viewpoint is a diagnostic for the semantic feature of duration. There are consistently different interpretations of the imperfective for durative and instantaneous events (12.2.2). The imperfective focuses the internal stages of durative events, and preliminary stages of instantaneous events. Super-lexical morphemes appear freely with duratives, focusing initial and final endpoints.

Super-lexical inceptive morphemes focus preliminary stages of instantaneous events, while cessative morphemes are ungrammatical. (36)-(37) illustrate with instantaneous verb bases:

(36) a. yi'niiltsa. (I started to catch sight of it.)$^{\text{PerfA:Mom}}$
b. bi'niilhdoon. (I started to burst it.)$^{\text{PerfA:Mom}}$
c. bi'niitáál. (I started to kick him.)$^{\text{PerfA:Mom}}$

(37) a. # niiníltsán. (He stopped looking at it.)$^{\text{PerfA:Mom}}$
b. # niinítáál. (He stopped kicking it.)$^{\text{PerfA:Mom}}$
c. # niiníłka'. (He stopped shooting at it.)$^{\text{PerfA:Mom}}$

These examples are presented and discussed in Smith 1996.

The semantic feature of telicity is not grammaticized in Navajo. The absence of telic situation types is related to the many-one pattern of lexicalization, which diminishes the distinction between telic and atelic events. But more generally there is no way of expressing grammatically the distinction between a telic and an atelic event.

Telicity tends to have indirect syntactic correlates (Chapter 3). The relevant linguistic expressions code notions that pertain to change of state, namely countability and completion. The notion of completion is not expressed formally in Navajo: verbs do not distinguish termination from completion, adverbials include duration and completion. The property of countability is relevant to telicity (Chapter 2). The Navajo nominal, however, does not distinguish quantized things from cumulative things: both nominals and nominal prefixes allow a mass or count interpretation.

The characteristic entailment patterns for telic and atelic situations can be demonstrated in some languages with sentences of different viewpoints. In Navajo one cannot construct sentences that represent these patterns. The typical pattern of entailment involves sentences that denote a situation in its entirety; but such verb bases are not always available. Nor do all VLCs have directly corresponding imperfective and perfective forms. Finally, recall that imperfectives are quite constrained for Group A VLCs (section 12.2).

Because the crucial forms do not exist, the categories of telic and atelic events cannot be established grammatically at the level of the situation type. The notion of telicity is available to Navajo speakers in other ways. I mention several of them here. The telicity of an event is sometimes coded lexically in the verb base. For instance, with motion verb stems certain prefixes indicate a destination and make the verb base telic. The Transitional VLCs has telic bases, and certain other VLCs involve telicity; see section 12.4.2. Some postpositions have different co-occurrence restrictions with telic and atelic verb bases. There are overt differences between telic and atelic forms, especially in motion verb bases (see Midgette 1996). Perhaps the very specificity of the verb base explains why the feature of telicity is not grammaticized in Navajo.

12.3.3 Durative events

The Durative situation type of Navajo is typically realized with an array of verb bases, denoting all or part of the event. Duratives are telic and atelic, as the examples illustrate:

(38) a. 'aho'niishtaał (to start to sing a song, ceremony)$^{\text{ImpfA:Mom}}$
b. nihonishtaał (to stop/finish singing a song, ceremony)$^{\text{ImpfA:Mom}}$
c. hashtaał (to be in the midst of singing a sing, ceremony)$^{\text{ImpfB:Dur}}$

(39) a. hooghan bidishníísh (to start to work on a hogan)$^{\text{ImpfA:Mom}}$
b. hooghan nibinishníísh (to stop working on a hogan)$^{\text{ImpfA:Mom}}$
c. hooghan binaashnish (to be working on a hogan)$^{\text{ImpfB:Cont}}$

The idealized event of (38) is telic (to sing a song), that of (39) is atelic (to work on

a hogan). Yet somewhat paradoxically the (a) and (b) verb bases of both arrays denote telic events, because they focus initial and final endpoints.

The paradox explains a good deal about the situation aspect of Navajo. The beginning of a durative event is a telic event: its natural endpoint is the change of state into the event. By the same logic, the ending is a telic event. The natural final endpoint is reached when the event ceases. The Navajo array neutralizes the feature of telicity.

The arrays associated with durative events differ in the number and focus of verb bases. One typical pattern is given in (40):

(40) a. diyógí bi'niitł'ǫ́. (I started to weave a blanket.)[PerfA:Mom]
b. diyógí ninítł'ó. (I finished weaving a blanket.)[PerfA: Mom]
c. diyógí yishtł'ó. (I'm weaving along on a blanket.)[ImpfB:Dur]
d. diyógí sétł'ǫ́. (I wove a blanket.)[ImpfB:Rep]

For some speakers the nominal *dahistł'ǫ́* (the weaving) must appear in (40a-c), rather than *diyógí*, which means "blanket" and suggests that the weaving is complete. The next array has only two bases, one presenting the event in its entirety and the other an inceptive.

(41) a. tá'díígizh. (I did the shearing [sheep].)[PerfA:Mom]
b. tábidi'niigizh. (I started to shear it.)[PerfA:Mom]

(41) shows that super-lexical morphemes, rather than VLC, determine the focus of a verb base. Both bases in this array have same VLC.

Durative events are also realized with a minimal array, that is, a single verb base. They occur in both Type A and Type B VLCs:

(42) a. 'ahidishkaał (to chop wood)[ImpfA:Mom]
b. chidí 'ánáshdlééh (to repair the car)[ImpfA:Mom]
c. yaaziid. (to pour it)[PerfA:Trans]
d. shéłt'izh (to hit once with blunt object)[PerfA:Sem]
e. bik'éshnił (to sprinkle on, as salt on meat)[ImpfB:Rep]
f. bitaashá (to visit them, go among them)[ImpfB:Divers]
g. yitaadaabaah (they raid among them)[ImpfB:Divers]

Bases like this are not unusual. Single verb bases tend to have certain prefixes, which may block related verb bases; morphological analysis may bring out an underlying relation between certain prefixes and VLCs. This is an interesting topic for future research.

Durative verb bases occur with durative verbs and adverbials, and with imperfective viewpoints. These are the linguistic expressions of duration. The possibilities for a given base depend on the VLC constraints and the forms available in the array to which it belongs. Type B VLCs appear freely with direct durative forms and with the imperfective viewpoint. Thus for verb bases from full arrays, Type B bases appear in sentences with direct duratives:

(43) a. 'ashtł'óogo 'i'íí'ą́.
I spent the day weaving.[ImpfB:Dur]

b. shá bíighah dibé nanishkaad.
All day sheep I herd around.[ImpfB:Cont]

The sentences have an imperfective viewpoint. Bases of Type A are not usually acceptable in such contexts. The constraint is formal, involving morphological categories.

Certain arrays lack Type B forms, e.g. (41) above, and there are many single Type A Durative verb bases. Typically such bases do not allow direct duratives. The indirect durative has no VLC constraints, however. The distribution of indirect duratives is semantically based: the adverbials occur felicitously with verb bases of durative events, regardless of VLC, as (44) illustrates:

(44) a. t'áá tąądee yootóógóó nisiikai.
We took our time going to Santa Fe and back.[PerfB:Contin]

b. t'áá tąądee bíláta'iigaii.
It bloomed slowly = gradually became white at the tip.[PerfA:Trans]

c. shizhé'é t'áá tłehee bee'eldǫǫh bílák'éétą́.
I handed the gun carefully to my father.[PerfA:Mom]

There are also some single Type A verb bases which are exceptions to the co-occurrence pattern of VLCs. They denote durative events, and may appear with direct temporal expressions. (45) illustrates; it is cited by Midgette 1987:78. The subordinate clause has the unpaired Type A verb base ['ahidi . . . kaał], while the main clause verb base is one that normally occurs only with VLCs of Type B:

(45) shizhé'é chizh ahidiłkaałgo i'íí'ą́'.
My father firewood he chop-GO sun go down.[ImpfA:Mom, PerfA:Mom]
My father chopped firewood all day long.

Sentences like (45) are exceptional because they have a direct durative with a Type A verb base. Although there are many unpaired bases, relatively few of them seem to be acceptable to native speakers with overt duratives.[9] It is difficult to predict which single bases of Type A can appear in conventionalized contexts such as subordinate clauses.

Crucial evidence for the semantic feature of duration is thus provided by single verb bases and arrays without Type B verb bases. The examples show that situation type overrides VLC for expressions that are not morphologically constrained.

The temporal schema of the situation type includes the initial and final endpoints of a durative event, and its internal stages:

(46) Durative event temporal schema
I . . . . . F

This schema applies to telic and atelic events.

Conventions of use: The arrays realizing durative events offer a set of choices. As with any closed system, the significance of a given choice depends on the others that are available. The dominant conventions suppose a full array. The imperfective viewpoint is identified with durativity, and is mutually exclusive with endpoints: it appears with Type B VLCs. The imperfective allows Type A VLCs only in adversative contexts. In contrast, the perfective focuses endpoints with super-lexical morphemes in Type A VLCs. This conventional pattern is discussed in section 12.2.5.

But if an array has no cessative, or has only Type A forms different choices present themselves. (47) illustrates the former case:

(47) a. bi'niit'įįh. ([Wheat, etc.] starts to ripen.)[PerfA:Mom]
b. neest'ą́. ([Wheat, etc.] ripen.)[PerfB:Dur]
c. noot'įįł. ([Wheat, etc.] is ripening along.)[ProgB:Curs]

To convey that the event has taken place in its entirety, one would use the perfective of (47b), a Type B verb base. The imperfective form of this verb base would be used in the conventional durative way. Thus the requirements of the array override the conventional use of Type B VLCs with the imperfective.

Minimal arrays with Type B bases are used in the same way; (48) illustrates several such cases:

(48) a. baa hashniih (to praise a person)[ImpfB:Dur]
b. bitaashtį' (to distribute among, e.g. pass out pencils)[ImpfB:Dist]
c. nánísh ne' to hit with a series of blows, e.g. w a hammer)[ImpfB:Rep]
d. yishtązh (to peck, tap)[ImpfB:Rep]

These verb bases have only a choice of viewpoint. The perfective conveys the event occurred in its entirety. Such verb bases are mainly in the Distributive, Diversative, and Repetitive VLCs.[10]

There are also arrays that have two verb bases, one inceptive and the other presenting the entire event. The latter verb base is often used cessatively, especially if it is of Type A, as in (49) and (50):

(49) a. yisdiz (to twist it)[ImpfB:Concl]
b. disgéés (to start to twist it)[ImpfA: Mom]

(50) a. yit'ees (meat, etc. is cooked)[ImpfA:Mom]
b. bi'niit'ees (meat starts to cook)[ImpfA:Mom]

The (b) forms convey a pragmatic emphasis on the final endpoint of the event. This pattern of use is based on the contrast between inceptive and cessative, and underlies the strong punctual feeling associated with all Type A VLCs.

Single durative bases of Type A have a pattern of use that clashes with the general convention. The imperfective viewpoint appears with such bases for the internal stages of an event, and in durative contexts.

These are the main conventional patterns of the arrays discussed here; there may well be others. Additional conventions due to the many-to-one lexicalization of Navajo is a topic for future research.

12.3.4 Instantaneous events

The Instantaneous situation type in Navajo appears exclusively in single verb bases of Type A. The situation type includes telic and atelic events, that is, both Achievements and Semelfactives:

(51) a. níyá (to arrive)[PerfA:Mom]
b. yiiłtsą́ (to catch sight of it)[PerfA:Trans]
c. sétbał (wave it one time, as a blanket)[PerfA:Sem]
d. sétkah (to shoot it)[PerfA:Sem]

There are distributional and conventional constraints on the imperfective viewpoint with Instantaneous bases. The imperfective does not appear freely, but is limited to the presentation of preliminary stages, and to backgrounded and adversative contexts, as noted. (52) illustrates; other examples are given in 12.2 above:

(52) a. taah yish'aah ńt'éé' bił néshjįįd.
I was putting it into the water[ImpfA], when I slipped and fell.

b. yiyiitał ńt'éé' hadeeshghaazh.
When he was just about to kick it[ImpfA] (e.g., ball) I shouted.

In (52a) the notionally instantaneous event is stretched out so that it functions as background for another event. In (52b) the imperfective focus preliminary stages. The progressive viewpoint is not available for Instantanous events; it requires the Cursive VLC.

The temporal schema for Instantaneous events has a single point (*E*) and preliminary stages, as in (53):

(53) Instantaneous event temporal schema
. . . . *E*

The preliminary stages can be focused by the imperfective viewpoint.

12.3.5 Statives

The Stative is a salient covert category in Navajo with unique grammatical properties. Each stative verb base is associated with one viewpoint morpheme which has the value of the neutral viewpoint in this context. Stative verb bases do not appear with

VLCs. The literature distinguishes 'active' and 'neuter' stems: neuter stems correspond to Statives and underlie Stative verb composites.

The range of Stative verb bases includes physical and mental attributes, locations, beliefs. The examples illustrate:

(54) a. tucsondi naashà. (I am in Tucson.)
b. nisneez. (I'm tall.)
c. yistsą. (I'm pregnant.)
d. nástáán taa yí'áá ńt'éé'. (The log used to extend into the water.)

Statives fall into three main formal classes, according to the Mode morpheme they require. One class of statives requires an Imperfective Mode morpheme, another class requires a Perfective, and the third requires forms close to the Progressive (Y&M:189 et seq). The classes have some semantic coherence: verb bases taking an imperfective or progressive morpheme are often attributive; those taking a perfective morpheme are often positional (Kari 1979).

Stative sentences allow either an open or closed interpretation. We can show this flexibility with conjunctions. It is felicitous to conjoin a stative with an assertion that the state continues, or with an assertion that it no longer obtains (using the morpheme *ńt'éé'*):

(55) dąądą́ą́' nástáán taah yí'áá ńt'éé'´ dóó t'ahdii taah yí'á.
Last spring the log extended into the water and it still does.

(56) nástáán taah yí'áá ńt'éé'.
The log extended into the water, but it doesn't now.

The examples show that the stative sentence has a flexible viewpoint, since it is reasonable in the context of either type of continuation. In the context of a stative verb base viewpoint morphemes are neutral semantically. This is formally somewhat different from the neutral viewpoint of LVM sentences, which arises by default.

Many statives have related inchoative verb bases, which denote the change into a state. The category includes bases for situations that are categorized as events in other languages. For instance, the verb base for a bell's ringing is the Neuter *diits'a'* (something making a noise, sounding). This is a topic for future research.

Habitual statives may be expressed by a Mode or an adverbial. Verb composites with the Usitative Mode are Stative, presenting a pattern of habitual events rather than a single event. The Usitative contrasts in the verb composite with the other Mode morphemes; like all non-viewpoint Modes, its viewpoint is automatically the Neutral viewpoint. The examples illustrate:

(57) a. 'e'e'ááh. (The sun usually sets.)[Usit]
b. taah yishááh. (I usually get into the water.)[Usit]

The Usitative is available generally for all types of verb bases. The Usitative Mode is frequently associated with a special verb stem shape; it is closely related to the

Iterative Mode, which uses the same verb stem. Strictly speaking the Iterative conveys recurrence, thus functioning as an indicator of a durative situation type; the two are almost interchangeable in actual use (Y&M 1987:156).

Navajo also has adverbials of frequency which form habitual stative sentences. This type of habitual appears with the full range of viewpoint choices. For instance:

(58) kii kindi t'óó naaghá́a łeh.
Kee customarily just loafs at the trading post.[ImpfB:Cont]

Due to the adverbial *łeh*, this is a stative sentence. The two types of habitual stative are very different formally: one is expressed by a Mode, the other has an adverbial and the usual range of viewpoints.

Summarizing, with Stative verb bases viewpoint Modes appear non-contrastively; in the context of a stative, all Modes have the semantic value of the neutral viewpoint.

12.4 Lexical and morphological factors in Navajo

In this section I discuss super-lexical morphemes and VLCs. Other topics concerning the lexicon that are relevant to this inquiry, but could not be included here: the distribution and productivity of inceptives and cessatives, the properties of Neutral bases, the makeup and predictability of single durative verb bases, the motion and activity groups of verb themes, the limits of prefix addition in a verb base.

12.4.1 Super-lexical morphemes

Super-lexical morphemes present a narrow view of a situation: this is their only contribution to the verb base. They are unlike lexical morphemes, which have content and help to determine the event itself. Compare *run* and *start to run*, for instance: ***run*** is lexical, *start* is super-lexical (Chapter 3).

Navajo has two types of super-lexical morphemes: prefixes and VLCs. The inceptive and cessative prefixes focus the initial and final endpoints of an event, and require verb bases of the Momentaneous and Transitional VLCs, both Type A. Focus on the middle of an event is conveyed by the Cursive and Continuative VLCs, Type B. This distribution follows the general pattern of Navajo. Type A VLCS are associated with endpoints. Type B VLCs are associated with internal stages, or events as a whole.

There are several inceptive prefixes, as in the array of (59). The Type A bases are inceptive, while the Type B bases focus the event in its entirety (a) or the internal stages of the event (e).

(59) a. násh'ah (to skin it)[ImpfB:Dur]
b. dish'ááh (to start to skin it)[ImpfA: Mom]
c. ńdí'níish'ááh (to just get a good start skinning it, when . . . .)[ImpfA:Mom]
d. bi'niish'ááh (to start up to skin it)[ImpfA:Mom]
e. yish'ah (to be in the process of skinning it)[ProgB:Curs]

This array has no cessative verb base.

The inceptive prefixes are available to most verb bases, although there are dependencies for certain sub-classes. The main prefixes are *di(i)-, nikidii-, hadini-, chí, 'i'nii'-, ńdii-*, illustrated in (60):

(60) a. di: yootóógóó déyá. (I completed starting for Santa Fe.)[PerfA:Mom]
b. niki: nikee'na'. (It (a snake) started to crawl.)[PerfA:Mom]
c. ha: hááchííl. (It started to snow.)[PerfA:Mom]
d. ch: ch'íníshnish (I started out to work)[PerfA:Mom]
e. 'i'nii: 'i'niicha (I started to cry)[PerfA:Mom]

There are subtle differences in meaning between these prefixes; see Y&M 1988 for discussion. Inceptives are sometimes idiosyncratic: a prefix may be inceptive generally but add lexical information in certain cases. For instance, when preceded by the prefix *ń-(ná-)* the prefix *di(i)-* has the complex meaning "pick up, raise, lift" (Y&M 1988:2). Navajo has no indeterminacy for inceptive focus: an inceptive prefix must appear in a verb base for this interpretation.[11]

The final endpoint of an event is focused by one of two cessative prefixes. They have the same shape, *ni-*; but different positions in the verb base and slightly different meanings (Y&M 1988). Cessatives indicate arbitrary and natural final endpoints, as Y&M make clear: "*ni-* indicates that verbal action reaches a stopping point, halts, or is finished" (1987:53). The examples illustrate:

(61) a. diyógí ninítł'ǫ́. (I finished weaving it.)[PerfA:Mom]
b. nihonítáál. (I finished singing.)[PerfA:Mom]
c. nininísą́. ([Corn] stopped growing, reached full growth.)[PerfA:Mom]

(61c) illustrates nicely the flexibility of the cessative: it is telic or atelic in meaning, as the translation indicates. Context determines which is chosen. Cessatives also appear in a composite prefix *bik'íni-* (62b):

(62) a. bíkádínétą́ą́' (to have started to look for someone)[PerfA:Mom]
b. bik'íninishtaah (to conclude a search for someone)[ImpfA:Mom]

The preceding prefix *bi-* is pronominal, indicating a personal object.

There are more inceptive than cessative forms, and they have a wider distribution. But conventions of use enable speakers to focus final endpoints. If an array lacks a cessative, speakers may indicate cessative focus by using a base that contrasts with an inceptive. Cessatives are also known as 'egressives'.

With a full array of contrasts, *ni-* can suggest an atelic rather than a telic cessation. (63) illustrates: here bases with different *ni-* prefixes contrast with a base which denotes the entire event (63a):

(63) a. 'íníshta' (to go to school)[ImpfB:Rep]
b. 'ałtso 'íłta' (to stop school)[PerfB:Rep]
c. tseebíjį' ni'nłta' (to go [school] as far as the 8th grade)[PerfA:Mom]

(63b), with a cessative, suggests a stopping point. It implicitly contrasts with going to school until no more grades are left, that is, finishing school as in (63c).

The cessative prefixes vary in meaning. Cessatives in bases involving motion can imply a destination without necessarily focusing it as the final natural endpoint. Thus the verb base of (64), with cessative *ni-*, denotes the entire event:

(64) ni'nłkǫ́ǫ́'. (I swam to a destination.)[PerfA:Mom]

In use, such bases are preceded by a form explicitly indicating the destination: they do not appear alone. There are also cases in which prefix *ni-* loses its super-lexical function even more noticeably:

(65) bá ni'nishjoołˌ.
I set it (e.g., hay) down for them = I feed them.[ImpfA:Mom]

The example is due to Midgette (p.c.).

The Cursive and the imperfective Continuative function as super-lexical morphemes, since they present internal stages of events. I now turn to a discussion of VLCs.

12.4.2 Verb Lexeme Categories

The VLCs, typical of Athabaskan languages, are morphological categories which combine with verb themes in event verb bases. They impose strong restrictions on the occurrence of a verb base with temporal adverbials and viewpoints. These restrictions are given above and will not be repeated here. In many cases the VLC of a verb coincides with its situation type; but VLC does not determine situation type. In clashes between situation type and VLC, situation type determines the occurrence of temporal expressions that are not morphologically based, and the use of the imperfective viewpoint.

These formal categories are known as 'aspectual' in Navajo linguistics. They have semantic names such as Momentaneous, Transitional, which suggest that they code the temporal features which are relevant to situation type. But the VLCs are morphological in nature, with variable semantic consistency. As Kari 1979 shows, formally VLCs are distinguished by one or more of three properties: a particular verb stem or set of stems, a signature prefix, and dependencies with particular viewpoint morphemes.

VLCs are essentially derivational categories which contribute to the verb base. But in addition to its VLC, a verb base may have prefixes of other kinds, in principle indefinitely many. The other prefixes may radically affect the meaning of the verb base. This unpredictability is one of the striking features of VLCs. It is thus impossible to give a single meaning for the VLCS except in the case of the Cursive and Continuative, which are super-lexical in function.

I give below the verb lexeme categories used in this book, with their traditional names and signature morphemes, if any. The list includes the main VLCs that are posited by both Kari 1989 and Y&M 1987. Other VLCs have been proposed for Navajo (the Conative, the Consecutive, the Persistive), but their status is still in doubt.[12]

(65) Verb Lexeme Categories

A		B
Momentaneous		Conclusive
Transitional	i-	Cursive ghi/yi (along)
Reversative	ná -	Continuative na(around about)
Semelfactive	yi-	Durative
Distributive	da-	(plural), taa
Diversative	tádi, na-	(multiple), taa
Repetitive		

The Momentaneous, Durative, and Repetitive categories do not have a signature morpheme. But the presence of such a morpheme does not guarantee semantic consistency.

The VLCs are related to the temporal features of dynamism and duration, as noted above. VLCs appear only in dynamic verb bases. The durative facts are more complex. VLCs of Type B are associated with duration: Verb bases of Type B all denote durative events, and may appear with direct durative expressions and the imperfective viewpoints. In contrast, bases of Type A denote both instantaneous and durative events. They have limited co-ccurrence with direct duratives and the imperfective viewpoint. Recall that the situation type of a verb base is determined by semantic features and syntactic properties. Durative verb bases of Type A occur with indirect duratives, though the direct duratives are blocked morphologically.

There is some interaction between viewpoint and VLC. The Cursive, which functions as a super-lexical morpheme, is uniquely associated with the Progressive viewpoint. The Continuative VLC varies with viewpoint. Imperfective, Continuative verb bases present atelic situations in progress; with the perfective, the same bases have a telic, round trip interpretation. (66) illustrates:

(66) a. tooh nílínígíí bii'na'ashkǫ́ǫ́'.
I swimming in the river.[ImpfB:Contin]

b. tsinaa'eełgóó ni'sétkǫ́ǫ́'.
I swam to the boat and back.[PerfB:Contin]

These examples show that both VLC and viewpoint may affect the meaning of a verb base; the same is true for habitual statives.

Internal structure: Most VLCs consist of one or more prefixes and the verb theme. The prefixes express notions such as directional, benefactive, reciprocal, plural. Some require a postpositional object, indicated by "P."

(67) Some Navajo Prefixes
'ahá—part, in half ('ahánishch'iish: to saw it apart)
bí—against it, reaching (bélk'ol: it's lapping against it)
chí—out horizontally (ch'íníshɑ́ɑ́h: to go out, exit)
P-ghá—through (béésh bighánítgeed: to stick a knife through it)
P'-ká—for, after (bíkádínísh'íí': to look for it)
k'í—apart (k'íních'iizh: he sawed it apart)

ná—back (taah náshdɑ́ɑ́h: to get back into the water)
náá—again (ninɑ́ɑ́hóółtą́: it rained again)
taah—into water (taah yíyá': I got into the water)
ya—upward (yaastséél: to stick up in the air, fingers, ears, tail)

This is only a very small sample: Y&M list many prefixes. The meaning of these prefixes is fairly predictable as they occur in VLCs. They are generally known as "adverbial". Some also function as postpositions. The variety makes it not at all surprising that VLCs do not pattern with situation types. There are also prefixes that combine idiosyncratically with particular forms at the level of the verb theme; they are known as thematic prefixes, and will not be discussed here.

VLCs may also contain a set of derivational morphemes such as the prolongative and seriative. They may combine with each other and with other prefixes. they are called 'sub-lexical' in Y&M 1987. (68) illustrates the Seriative, which occurs with motion verb bases.

(68) The Seriative morpheme
a. áhéélhéshyeed. (I run around in a series of circles.)[ImpfA:Mom]
b. yah 'ahikɑ́ɑ́h. (They go in one after another, e.g. arrows.)[ImpfA:Mom]
c. 'iih hishteeh. (I'm putting them in one after another e.g., into a box.)[ImpfA:Mom]

The sub-lexical morphemes can appear in complicated verb bases. The base of (69), for instance, has two sub-lexical morphemes, the semeliterative, conveying an event that is repeated one more time, and the prolongative, conveying that a person or object remain in a state of having begun to perform the action denoted (Y&M 1987:166-167).

(69) chidí hashtł'ish yiih nɑ́ɑ́dinoolwod.
The car again ran into the mud and got stuck.[PerfA:Mom]

There may be a pragmatic upper bound as to how many prefixes—lexical, sub-lexical, and super-lexical—can appear in one base.

12.5 Time expressions in Navajo

12.5.1 Temporal location: tense and adverbials

The Navajo system has a single tense, the Future, which appears in the Mode position. The Future locates a situation at a time after the moment of speech. It is often used to talk about situations at some distance from the present. The Optative is a future Mode, conveying that a situation is potential or wished-for (Y&M 1987).

The aspectual viewpoints locate situations temporally by pragmatic convention. Unless there is information to the contrary, sentences with the imperfective viewpoints indicate Present time, sentences with the perfective viewpoint indicate Past time.

Explicit temporal location is given by special verbal expressions and by temporal adverbials. The morpheme *ńt'éé'* (it was) indicates that a situation is Past; *dooleeł* (it will be) indicates a Future situation. *Doleeł* is used to convey the Future with stative bases, which do not appear with contrasting Modes. Adverbials can locate a situation in the Past, Present, or Future.

The Future tense conveys the Neutral viewpoint. The two-component theory predicts the Neutral viewpoint with this tense, since the Future contrasts with the explicit viewpoint morphemes. Thus sentences with the Future tense are LVM sentences (Chapter 4).

12.5.2 Temporal duration

The syntax of temporal duration is quite complex in Navajo grammar, with a network of constructions and constraints which are particular to Athapaskan languages.[12] Verbs and adverbials of direct duration have rigid co-occurrence constraints for event verb composites: they require a VLC of Type B, and the imperfective viewpoint. LVM sentences (Statives and Future tense) also appear with durative expressions. In constrast, the class of indirect durative adverbials is morphologically unconstrained. I begin with durative verbs, the most idiosyncratic; I then discuss durative adverbials and the expression of temporally related situations. The syntax of duration also affects the conventions of use noted in the preceding section.

The durative verbs of Navajo express the passing of time, e.g. *hodíína'* (time-passed[Perf]), *í'íí'á* (the day passed[Perf]), *ahéé'ílkid* (clock hand slid in a circle[Perf]). They appear as the main verbs of complex sentences when used to indicate duration; the situation itself is given in a subordinated clause. (70) illustrates; *-go* is the surbordinating prefix:

(70) a. náháshgodgo shee 'i'íí'a.
I hoe + the day passed: I spent the day hoeing.[ImpfB, PerfA]

b. 'ashhoshgo hodíína'.
I sleep + time passed: I slept for a long time.[Neut, PerfA]

The subordinate clause of (70b) is stative in Navajo. The viewpoint of the subordinate sentence is restricted: the perfective in such sentences is ungrammatical. Compare (71a-b), from Midgette (1987:74):

(71) a. 'ashtł'óogo 'i'íí'á.
I weaving all day long: I wove all day long.[ImpfB:Rep]

b. *'asetł'óogo 'i'íí'á.
I weave all day long.[PerfB:Rep]

In this construction the temporal verb composite is syntactically independent. Navajo does not have a syntactic structure in which a temporal verb has a direct grammatical relation to another verb constellation. There are no direct equivalents of English verbs

like *take* and *spend* , which have sentential complements (*It took me an hour to fall asleep*; *I spent an hour rehearsing my part*).

The VLCs of these sentences are all of Type B. This is another requirement of the construction: verb bases with Type A VLCs are generally impossible. There are exceptions. Certain Type A VLCs appear the contexts usually reserved for Type B, as in (45).

There is also a class of direct durative adverbials, e.g. *shiidą́ą'dii* (for a long time), *shá bíighaah*(commensurate with the sun: all day long). They are compatible only with Type B verb bases and with the imperfective viewpoints, as in (72):

(72) a. shiidą́ą'dii na'nízhozhígóó shił 'oolwoł.
For a long time, I was driving toward Gallup.[ProgB:Curs]

b. shá bíighah hooghan binaashnish.
All day, I work on the hogan.[ImpfB:Cont]

These examples demonstrate the close association between duration and the imperfective viewpoint. In fact, an imperfective main or subordinate sentence is required by durative forms, as (71b) shows.

(73) a. tł'éé'´ bíighah shił oolwołgo biniinaa k'ad ch'éé́h déyá.
I'm tired now because I drove all night.[Impf]

b. * tł'éé'´ bíighah shił eelwod.
all-night with-me vehicle went.[Perf]

With a perfective the result is ungrammatical (Midgette 1987:100).

I turn now to the class of indirect durative adverbials. The class is important for this work since it shows that the duration of an event can be semantically determined, rather than dependent on the VLC of the verb base. Some expressions imply temporal duration, rather than stating it: for instance *t'áá kóódígo* (slowly), *t'áá tłehee* (slowly and cautiously), *t'áá tąądee* (slowly). These adverbials are semantically rather than formally restricted in distribution: they appear with durative verb bases, regardless of VLC and viewpoint. (74) illustrates with Type B verb bases, (75) with Type A bases:

(74) a. t'áá kóódígo bilasáana yiyą́ą'.
I slowly ate an apple/apples.[PerfB:Dur]

b. t'ąądee 'olta'góó yisháát.
I'm slowly walking to school.[ProgB:Curs]

(75) a. shichidí t'áá tłehee ninítbą́ąz.
I parked my car slowly and carefully.[PerfA:Mom]

b. t'áá tłehee shidá'ák'eh binaagóó béésh'adishahí násht'ih.
I'm slowly, carefully putting a barbed wire fence around my field.[ImpfA:Rep]

The examples show that durative verb bases with VLCs of Type A are felicitous with indirect durative adverbials. The adverbials are not felicitous with verb bases of instantaneous events.

Temporally related situations: The subordinating particle *-go* can indicate that situations are temporally related. In this function it is quite flexible: the situations may be simultaneous, overlapping, or in sequence. The interpretation depends partly on aspectual information, partly on lexical and world knowledge. The cases are schematized in (76) for the perfective and imperfective viewpoints.

(76) Structures conveying temporal relations between situations
a. $_S$[$_S$[...Impf+*go*] Perf] Overlapping
b. $_S$[$_S$[...Impf+*go*] Impf] Simultaneous
c. $_S$[$_S$[...Perf+*go*] Perf] Sequence
d. $_S$[$_S$[...Perf +*go*] Impf]* (ungrammatical)

I give examples illustrating the main types. Both viewpoint and situation type affect interpretation. If both verb composites have an imperfective viewpoint, and one event is durative and the other instantaneous, the overlapping interpretation is natural.

(77) Overlapping events
a. ch'íníshą́ahgo dégo'.
As I was going out, I tripped and fell.[ImpfA: Mom, PerfA:Mom]

b. 'atiingóó yigáałgo shiiłtsą́.
As he walked along the road, he saw me.[ProgB:Cur, PerfA: Mom]

c. tł'éédą́ą́' 'ashhoshgo shichidí shee neest'íí'.
Last night as I was sleeping my car was stolen.[Neut, PerfA:Mom]

If both viewpoints are imperfective and both events are durative, the situations are taken as simultaneous, as in (78); if both clauses are perfective the events are sequenced, as in (79).

(78) Simultaneous events
a. dibe nanishkaadgo hataał.
He sang as I herded the sheep.[Impf,Impf]

b. dibé nanishkaadgo hodootał .
While I herd sheep, he will sing.[Fut, Fut]

(79) Sequenced events
a. 'ani'įįhii shiiłtsą́ągo sits'ą́ą' dah diilwod.
When the thief saw me he took off on the run.[Perf, Perf]

b. 'i'íí'ą́ądoo bik'ijį' 'ííyą́ą'.
After the sun went down, I ate.[Perf, Perf]

c. hastiin ná'ádlį́įhgo shik'inéilwo'.
When my husband drinks, he attacks me.[Iter, Iter]

There are variations in interpretation. For instance, (79b) can also be taken to mean "When I ate the sun went down". The possibilities are similar for sentences with the neutral viewpoint. Sentences like these are often used to background a situation. The main clause event is presented against a background of the ongoing situation in the subordinate clause.

The interpretation of events as overlapping events is due to the open information structure of the imperfective viewpoints; that of sequenced events is due to the closed structure of the perfective. The subordinator *-go* has other interpretations as well (Schauber 1979:32).

The durational verbs and adverbs of Navajo are associated strongly with the imperfective viewpoint and with Type B VLCs. However, the indirect duratives are not constrained by VLCs. The forms and structures investigated here all convey notions of simple duration and are compatible with situations of all types.

Appendix: Examples of VLCs
1. Type A VLCs: Instantaneous or Durative events
Momentaneous: In spite of its label, this is the the largest and most varied of the VLCs. This list emphasises durative bases.
diitááh (it shatters), haashłé (take out SFO), bik'íhásh'ááh (put blame on P), **áshłéél** (make O), disht'éél (extend in straight line (wire) 'anáháshgeed (fill a hole back up by shoveling) bighá'níshgéél (dig or tunnel through), ndíshgéél (cut through, as a dam).

Transitional: The category is unusual in that all bases are telic; they vary in duration. yiiłtoo**ł** (clear up, as murky water), yiibáá**h** (become gray), diilkǫǫ**h** (become smooth), yiizį́**h** (he's coming to a standing position), diishch'éé**h** (open one's mouth), yiishshį́**h** (blacken O).

Reversative: The signature morpheme, *~~náhi~~* (*s*), means to turn an object around or over; and more generally any type of semicircular motion. Turning an object has a natural endpoint, but semicircular motion does not. Bases vary in telicity and duration. áyiiłtéél (he turns an animate being over, around etc[Impf]), náyiiléél (he turn around, over, a ropelike object[Impf]), náhájįsh (. . . turning himself so as to lie on his side[Impf]) náyiidéél (move in a circle back to a starting point[Impf]), ńdeesht'ih (I will set O in a circle, e.g. rocks).

Semelfactive: The category varies in telicity and duration. Many bases are typical Semelfactives, e.g. yiyiiłtąsh (bird gives a peck); others are telic, e.g. yiyiighas (scratch it). Durative bases include yiisdis/sédis (to roll O up in a tarpaulin), 'iisgis (to do laundry), 'iishnih (to do the milking).

2. Type B VLCs: Durative events, or portions of Durative events.
Conclusive: This VLC appears with the *si-* conjugation Mode prefix. Most but not all members of the category are telic.
yishbéézh´(to boil, cook it), nish'ɪ̨h (to steal O), yishjeeh (to grease), nishk'ah (to get fat), yooshnéél (to forget), yishchí (to give birth to), yisht'eesh (to paint O black), yisdiz (to spin it), ntséskees (to think).

Continuative: The following list contains only imperfectives which focus on the internal stages of an event.
naakaad (spreads around—as a plant), tł'óo'di naashá (I'm walking around outside) naash'na' (be crawling around), naada' (he's lounging around), ndi'ni' (he's going about moaning).

Cursive: The Cursive category is the obligatory VLC counterpart of the Progressive viewpoint. It functions as a super-lexical morpheme, focusing on the internal stages. heeshɑ́ɑ́l (shuffling along), deessoh (go along with mouth full), heesht'eeł (hop along), nɑ́ɑ́sheláɑ́ł (walk along back), ɑ́ɑ́shdɪ̨ɪ̨ł (dwindling away), béésshhił (push it along).

Durative: Durative bases are telic or atelic.
yashti (I'm talking), łídíshchí (I'm flattering him), yishtł'ó (weave O), yishkeed (to eat a roundish, chunky thing), yishbéézh (cook O), náshkad (to sew it), yishdlą́ (to drink it).

Repetitive: a multiple event category
yishch'id (scratch it), yishhozh (tickle him), yishkad (flap it, slap it—as, a dusty hat), náshkad (I'm sewing it), béshtłoh (smear O on it, as grease), sitsiits'iin tálɑ́wosh bésh'ɑ́ɑh (I'm rubbing O (a bar of soap) on my head).

Distributive: a multiple event category
biih daash'a' (to place each one 3 + into it), ndaash'a' (set 3 + objects), tł'oh 'ałch'ɪ́' be'estł'óníɡíí łɪ́ɪ̨' bá ndaash'a'/ndasé'ą́ (I setting/set 3 + bales of hay around in each of 3 + locations for the horses).

Diversative: a multiple event category
bitaasha (visit them, go among them), jɪ́ɪ́dɑ́ɑ́ą́' shinaadɑ́ɑ́ą́ bitaaséyá (I visited my corn (field) today), yitaadaabaah (they raid among them, make war on them).

Notes

[1] I would like to express particular thanks to Sally Midgette, who gave with enormous generosity of her knowledge, her ideas and advice, and her time; she also contributed a careful reading of the manuscript. I thank Robert Young for his comments and meticulous corrections of the manuscript. I also thank Ken Hale for stimulating discussions. All errors of fact and interpretation are mine, of course.

Since writing this Chapter I have further developed the analysis of the aspectual categories of Navajo; see Smith 1996.

[2] The primary works on Navajo that I consulted are Young & Morgan 1987(Y&M), Young, Morgan & Midgette 1992 (YMM), Kari 1979, 1990, Midgette 1987, Speas 1986; also Hardy 1979, Sapir & Hoijer 1967, Witherspoon 1977. Most examples are drawn from Y&M 1987, and YMM 1992.

[3] Many scholars collapse the two types of paradigmatic prefixes in a single stage; I retain the distinction to clarify the makeup of the verb composite. The distinction between pronominal and Mode prefixes will not be important in the discussion. Kari recognizes three main levels of the Athapaskan verb, the Lexical, Derivational, Inflectional and Post-inflectional, which he presents in a detailed model (1990: 39). The verb base appears at the first two levels. Y&M distinguish Root, Stem, Theme, Base, and paradigmatic prefixes (1987:140).

[4] I introduce this convention because the verb base is an abstraction which associates prefixes of various types with a set of stems. I choose the imperfective stem because it conforms with the practice, made standard by Y&M, of using imperfectives as citation forms.

[5] This is a very rough summary of an intricate pattern. For details, and another point of view, see Y&M 1987, Midgette 1996. These authors argue that the overt morphemes associated with the perfective have consistent semantic force. Krauss 1969 agrees with the principle but suggests slightly different meanings for particular morphemes. Unfortunately the suggested revision is made in a one-sentence footnote, without evidence. Axelrod takes a position similar to mine in discussing Koyukon, another Athabaskan language. She argues that, in spite of the regularities between prefixes and Mode morphemes, there are too many interacting factors for semantic consistency to be maintained (1993:Chapter 3).

[6] There are notorious difficulties in characterizing the meanings of intonational features. Many interesting examples are given by Hirschberg & Pierrehumbert. They reach no conclusion about how to deal with intonational features of contrast (1986:192-3); their views are compatible with the abstract approach suggested here.

[7] Since there is a verb base that refers to the event in its entirely, one might treat the others as cases of shifted focus (Chapter 3). The multiple analysis is preferable because it brings out the many-one relation of verb base and idealized event in the language.

[8] These comments are based on YMM 1992, which presents verb bases of different VLCs organized according to the root on which they are based. The information in this work makes it possible to study bases in related VLCs and to investigate the notion of array. I give another example of the striking differences in number and generality between Type A and Type B VLCs. There are close to 50 Type A verb bases involving the notion "drive" from the root [lo'], among them the following ['a . . . łeeh] (drive unspecified object), ['a'a . . . łeeh] (drive vehicle away out of sight, ['ada . . . łeeh] (drive vehicle into, e.g. a wash), ['ada'a . . . łeeh] (drive down from a height), ['ahéná . . . łeeh] (make a circuit driving), [ná . . . łeeh] (drive or carry something around, detour around), [yisdá . . . łeeh] (drive to safety). There are 5 Type B bases concerning driving generally, from the same root, e.g. ['a . . . łoh] (drive along in a vehicle). Other bases from this root have meanings such as "throw loops", "carry by a handle", "put on brakes", "trick, lure". There are also many other bases referring to driving: for instance the root [bɑ́ɑ́] has a large number of such bases, which tend to involve rolling and circular motion.

[9] The topic of single durative verb bases requires systematic study. 10. The perfective is not always available for multiple event VLCs. Some Type B bases have only the imperfective form, for instance *nikidishniih* (to bounce, dribble, as in basketball)$^{\text{Impf B: Rep}}$, *dah ńdíno'* (to rise, leap, e.g. flames)$^{\text{Impf B: Rep}}$, *yita'* (to flutter, flicker, e.g. eyelid, wing, pulse)$^{\text{Impf B:Rep}}$.

[10] The specificity of Navajo bases means that the familiar *almost* ambiguities do not occur, as in *I almost closed the door*. Such ambiguities depend on indeterminacy in the surface form which allow different scopes for the adverb.

[11] For simplicity I have used a relatively small set of VLCs. The precise number of morphological categories that can be justified for Navajo does not affect the material presented here. The set of VLCs is determined by subtle morphological analysis which is beyond the scope of this discussion. See Kari 1979, 1990, and Hardy 1979.

REFERENCES

Abusch, Dorit. 1986. 'Verbs of Change, Causation, and Time'. Center for the Study of Language and Information Report No. 86-50. Stanford University.

Ahn, Yoonja. 1995. *The Aspectual and Temporal Systems of Korean*. Dissertation, University of Texas at Austin.

Aksu, Ayhan. 1978. *Aspect and Modality in the Child's Acquisition of the Turkish Past Tense*. Ph.D dissertation, University of California at Berkeley.

Antinucci, Francesco, & Ruth Miller. 1976. 'How Children Talk about What Happened'. *Journal of Child Language* 3: 167-189.

Asher, Nicholas. 1986. 'Belief in Discourse Representation Theory'. *Journal of Philosophical Logic* 15: 127-189.

Asher, Nicholas. 1993. *Reference to Abstract Objects in Discourse*. Dordrecht: Kluwer Academic Publishers.

Asher, Nicholas. 1996. 'Mathematical Treatments of Discourse Contexts'. *Proceedings of the Tenth Amsterdam Conference on Formal Semantics Vol. I, 1996*. ILLC Publications, Amsterdam, Holland, pp.21-40.

Asher, Nicholas, & Hajime Wada. 1988. 'A Computational Account of Syntactic, Semantic and Discourse Principles for Anaphora Resolution'. *Journal of Semantics* 309-344.

Austin, John. 1961. *Philosophical Papers*. Oxford: Oxford University Press.

Axelrod, Melissa. 1992. *The Semantics of Time: Aspectual Categorization in Koyukon Athabaskan*. Lincoln, Nebraska: University of Nebraska Press.

Bach, Emmon. 1980. 'Tenses and aspects as functions on verb-phrases'. In C. Rohrer (ed), *Time, Tense and Quantifiers*.Tübingen: Max Niemeyer.

Bach, Emmon. 1986. 'The Algebra of Events'. *Linguistics and Philosophy*. 9.1: 5-16.

Baker, Carl L. 1989. *The Syntax of English*. Cambridge, Mass.: MIT Press.

Bakhtin, Mikhail. 1981. Translated by C. Emerson & M. Holquist. *The Dialogic Imagination*. Austin, Texas: University of Texas Press.

Banfield, Ann. 1981. *Unspeakable Sentences: Narration and Representation in the Language of Fiction*. Boston & London: Routledge & Kegan Paul.

Bar-Hillel, Yehoshua. 1954. 'Indexical Expressions'. *Mind* 63: 359-76.

Bauer, Gregory. 1970. 'The English 'Perfect' Reconsidered'. *Journal of Linguistics* 6: 189-198.

Beardsley, Monroe. 1966. 'Style and Good Style'. In G. Tate (ed), *Reflections on High School English: NDEA Institute Lectures 1965*. Tulsa, Oklahoma: University of Tulsa.

Bennett, Michael & Barbara Partee. 1978 (1972). *Toward the Logic of Tense and Aspect in English*. Bloomington, Indiana: Indiana University Linguistic Club.

Benveniste, Emile. 1956. 'La Nature des Pronoms'. In M. Halle (ed), *For Roman Jakobson*. The Hague: Mouton.

Binnick, Robert. 1991. *Time and the Verb*. New York/Oxford: Oxford University Press.
Boertien, Harmon. 1979. 'Toward a Unified Semantics of Aspectual Verbs with To and Ing'. *Proceedings, 15th Annual Meeting, Chicago Linguistic Society*. Chicago, Illinois: Chicago Linguistic Society.
Boguslawski, Andrzej. 1963a. *Perfektivnye glagoly v russkom jazyke*. Slavia 32(1): 17-35.
Boguslawski, Andrzej. 1963b. *Prefiksacja czasownikowa we współczesnym jezyku rosyjskim*. Wroclaw: Ossolineum.
Boguslawski, Andrzej. 1972. 'K voprosu o semanticeskoj storone glagol'nyx vidov'. *Z polskich studiów slawistycznych. Seria 4: Prace na VI y miedzynarodowy kongres slawistów w Warszawie 1973*. Tom 1: Jezykoznawstwo, 227-32. Warsaw: Panstwowe wydawnictwo naukowe.
Bondarko, Aleksandr V. 1971. *Vid i vremja russkogo glagola (znacenie i upotreblenie)*. Moscow: Prosvescenie.
Borillo, Andrée. 1988. 'L'expression de la durée: construction de noms et de verbes de mesure temporelle'. *Linguisticae Investigationes*. Tome XII.2: 363-396.
Both-Diez, A-M. 1985. 'L'aspect et ses implications dans le fonctionnement de l'imparfait, du passé simple et du passé composé au niveau textuel'. *Langue Française*, 67: 5-22.
Bransford, John D., J. Richard Barclay, & Jeffery J. Franks. 1972. 'Sentence memory: a constructive vs. interpretive approach'. *Cognitive Psychology* 3: 193-209.
Brecht, Richard. 1984. 'The Form and Function of Aspect in Russian'. In M. Flier & R. Brecht (eds), *Issues in Russian Morphosyntax. 9-34. UCLA Slavic Studies, vol. 10*. Columbus, Ohio: Slavica Press.
Brown, Roger. 1958. *Words and Things*. New York: Free Press.
Brown, Roger. 1965. *Social Psychology*. Cambridge, Mass: Harvard University Press.
Brown, Roger. 1973. *A First Language: the Early Stages*. Cambridge, Mass: Harvard University Press.
Bull, William. 1971. *Time, Tense and the Verb*. Berkeley, California: University of California Press.
Carlson, Gregory N. 1977. 'A Unified Analysis of the English Bare Plural'. *Linguistics & Philosophy* 1.3: 413-456.
Carlson, Gregory N. & Francis J. Pelletier, (eds). *The Generic Book*. Chicago University Press, 1995.
Carlson, Lauri. 1981. 'Aspect and Quantification'. In P. Tedeschi & A. Zaenen (eds), *Syntax and Semantics 14: Tense and Aspect*. 31-64. New York: Academic Press.
Carrier-Duncan, Jill, & Janet Randall. 1986. 'Derived Argument Structure: Evidence from Resultatives'. Milwaukee Morphology Meeting, Milwaukee, Wisconsin.
Cartier, Anne. 1972. *Les Verbes Resultatifs en Chinois Moderne*. Paris: Klincksieck.
Chan, Marjorie K. M. 1980. 'Temporal Reference in Mandarin Chinese: An Analytical-Semantic Approach to the Study of the Morphemes le, zai, zhe and ne'. *JCLTA* 15.3: 33-79.
Chang, Vincent. 1986. *The Particle Le in Chinese Narrative Discourse: an Integrative Description*. Ph.D dissertation, University of Florida.
Chao, Yuen Ren. 1968. *A Grammar of Spoken Chinese*. Berkeley: The University of California Press.
Chen, Gwang-tsai. 1979. 'The Aspect Markers *le*, *guo*, and *zhe* in Mandarin Chinese'. *Journal of the Chinese Language Teachers Association* 14.1: 27-46.
Cheung, Hung-nin. 1973. 'A Comparative Study in Chinese Grammars: the *Ba* construction'. *Journal of Chinese Linguistics* 1.1:343-386.
Chomsky, Noam. 1970. 'Deep structure, surface structure and semantic interpretation'. In *Chomsky*, 1972.
Chomsky, Noam. 1972. 'Remarks on Nominalization'. In *Studies on Semantics in Generative Grammar*. The Hague: Mouton.
Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
Chomsky, Noam. 1988. *Language and Problems of Knowledge*. Cambridge, Mass: The MIT Press.
Chu, Chauncey. 1976. 'Some Semantic Aspects of Action Verbs'. *Lingua* 40: 43-54.
Chu, Chauncey. 1983. *A Reference Grammar of Mandarin for English Speakers*. New York: Peter Lang.
Chung, Sandra & Alan Timberlake. 1985. 'Tense, Aspect and Mood'. In T. Shopen (ed), *Language Typology and Syntactic Description. Vol. 3: Grammatical Categories and the Lexicon*. Cambridge: Cambridge University Press.
Chvany, Catherine. 1975. *On the Syntax of BE-sentences in Russian*. Cambridge, Mass: Slavica Publishers, Inc.

Chvany, Catherine. 1983. 'On Definiteness in Bulgarian, English and Russian'. In M. Flier (ed), *American Contributions to the Ninth Interational Congress of Slavists*. Kiev. Vol 1.
Clancy, Patricia M. 1986. 'The Acquisition of Japanese'. In D. Slobin (ed), *The crosslinguistic study of language*. New York: Erlbaum.
Cochrane, Nancy J. 1977. *Verbal Aspect and the Semantic Classification of Verbs in Serbo-Croatian*. Ph.D dissertation, University of Texas at Austin.
Cochrane, Nancy J. ed. *Verbal Aspect and the Telic:Atelic Distinction in Serbo-Croatian*. Unpublished ms.
Comrie, Bernard. 1976. *Aspect*. Cambridge, England: Cambridge University Press.
Comrie, Bernard. 1976. 'The Syntax of Action Nominals: A Cross-Language Study'. *Lingua* 40: 177-201.
Comrie, Bernard. 1980. *Nominalizations in Russian: Lexical Noun Phrases or Tansformed Sentences*. Chvany and Brecht, 212-220.
Comrie, Bernard. 1986. *Tense*. Cambridge, England: Cambridge University Press.
Covington, A., & N. Schmitz. 1987. *An Implementation of Discourse Representation Theory*. ACMC Research Report 01-0023, Advanced Computational Methods Center, University of Georgia.
Craik, Kenneth. 1943. *The Nature of Explanation*. Cambridge, England: Cambridge University Press.
Croft, William. 1987. *Categories and Relations in Syntax: the Clause-Level Organization of Information*. Ph.D dissertation, Stanford University.
Curme, George.1935. *A Grammar of the English Language*. Boston: Heath.
Dahl, Östen. 1985. *Tense and Aspect Systems*. Oxford: Blackwell.
Davidson, Donald. 1967. 'Truth and Meaning'. *Synthese*. 17: 304-323.
Davidson, Donald. 1980 (1967). 'The Logical Form of Action Sentences: Criticism, Comment and Defense'. In *Essays on Actions and Events*. Oxford: Clarendon Press.
Descles, Jean P. 1980. 'Construction Formelle de la Catégorie Grammaticale de l'Aspect'. In David, J. & R. Martin (eds). *La Notion d'Aspect*. Paris: Klincksieck.
Dowty, David. 1977. 'Towards a Semantic Analysis of Verb Aspect and the English Imperfective Progressive'. *Linguistics and Philosophy* 1: 45-77.
Dowty, David. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Reidel.
Dowty, David. 1986. 'The Effects of Aspectual Class on the Temporal Structure of Discourse: Semantics or pragmatics?' *Linguistics and Philosophy* 9.1: 37-62
Dowty, David. 1991. 'Thematic proto-roles and argument selection'. *Language*, 67: 547-619.
Dowty, David, Robert Wall, & Stanley Peters. 1981. *Introduction to Montague Semantics*. Dordrecht: Reidel.
Du, Juliet Wai Hong. 1996. *The imperfective viewpoint of* te-iru *in Japanese*. MA thesis. University of Texas at Austin.
Ducrot, Oswald. 1979. 'L'Imparfait en Francais'. *Linguistische Berichte* 60: 1-23.
Dupont, Norbert. 1986. 'Les valeurs aspectuo-temporelles du passé composé en français dans le système de l'indicatif'. In Remi-Giraud, S. & M. Le Guern (eds). *Sur le Verbe*. Lyons: Presses Universitaires de Lyon.
Eckert, Eva. 1984. *Aspect in repetitive contexts in Russian and Czech*. Flier & Timberlake, 169-80.
Ferrell, James. 1951. 'The meaning of the perfective aspect in Russian'. *Word* 7(2): 104-35.
Ferrell, James. 1953. 'On the Aspects of byt' and on the Position of the Periphrastic Imperfective Future in Contemporary Literary Russian'. *Word* 9: 362-76.
Fielder, Grace. 1983. *Aspect of the Russian Infinitive Complement*. Ph.d dissertation, University of California at Los Angeles.
Fillmore, Charles. 1971. *Lextures on Deixis*. Indiana University Linguistics Club, University of Indiana.
Fleischman, Suzanne. 1983. 'From Pragmatics to Grammar: Diachronic Reflections on Complex Pasts and Futures in Romance'. *Lingua* 60: 183-214.
Fleischman, Suzanne, 1995. 'Imperfective and Irrealis'. In J. Bybee & S. Fleischman (eds), *Modality in Grammar and Discourse*. Amsterdam/Philadelphia: Benjamins.
Flier, Michael. 1985. 'The Scope of Prefixal Delimitation in Russian' In M. Flier & A. Timberlake (eds), *The Scope of Slavic Aspect. UCLA Slavic Studies, volume 12*. Columbus, Ohio: Slavica Press.
Foley, William & Robert Van Valin. 1984. *Functional Syntax and Universal Grammar*. Cambridge: Cambridge University Press.
Forsyth, John. 1970. *A Grammar of Aspect: Usage and Meaning in the Russian Verb*. Cambridge: Cambridge University Press.

Fortescue, Michael. 1984. *West Greenlandic. Croom Helm Descriptive Grammar Series.* London: Croom Helm.
Freed, Alice. 1979. *The Semantics of Aspectual Verb Complementation.* Dordrecht: Reidel.
Frey, Werner. 1985. 'Syntax and Semantics of Some Noun Phrases'. In Laubsch, J. (ed), *Proceedings of GWAI*, Springer.
Friedrich, Paul. 1974. 'On Aspect Theory and Homeric Aspect'. *IJAL Memoir 28.* Chicago, Illinois: University of Chicago Press.
Garey, Howard. 1957. 'Verbal Aspect in French'. *Language.* 33.2: 91-110.
Garnham, Alan. 1985. *Psycholinguistics: Central Topics.* London: Methuen.
Garnham, Alan. 1987. *Mental Models as Representations of Discourse and Text.* Chichester: Ellis Horwood.
Garnham, Alan & Jane Oakhill. 1989. 'The everyday use of anaphoric expressions: implications for the Mental Models theory of text comprehension'. In Sharkey, N.E. (ed), *Modelling Cognition: An Annual Review of Cognitive Science, Vol. 2.* Norwood, N.J.: Ablex.
Gelman, Rachel. 1990. 'First principles organize attention to and learning about relevant data: Number and the animate/inanimate distinction', *Cognitive Science*, 14: 79-106.
Givon, Talmy. 1972. 'Studies in ChiBemba and Bantu Grammar'. *University of California Publications in Linguistics, 32.* Berkeley, California.
Glovinskaja, M. Ja. 1981. 'Obscefacticeskoe znacenie nesoversennogo vida (formy prosedsego vremeni)'. *Problemy strukturnoj lingvistiki 1978,* ed. by V. P. Grigor'ev, 108-24. Moscow: Nauka.
Graham, Daniel. 1980. 'States and Performances: Aristotle's Test'. *The Philosophical Quarterly 30:* 117-30.
Green, Georgia. 1980. 'Some Wherefores of English Inversion'. *Language* 56.3: 582-601.
Greenberg, Joseph. 1966. *Language Universals, with Special Reference to Feature Hierarchies.* The Hague: Mouton.
Grévisse, Maurice. 1949. *Le Bon Usage: Grammaire Française.* Gembloux, Belgium: Duculot.
Grice, H. P. 1975. 'Logic and Conversation'. Peter Cole & Jerry Morgan (eds), *Syntax and Semantics: Speech Acts.* New York: Academic Press.
Grimshaw, Jane & Armin Mester. 1988. 'Light Verbs and Theta Marking'. *Linguistic Inquiry* 19.2: 205-232.
Gruber, Jeffrey. 1976. 'Lexical Structure in Syntax and Semantics'. *North Holland Linguistics Series, 25.* Amsterdam: North-Holland.
Guenthner, Franz. 1986. 'Linguistic Meaning in Discourse Representation Theory'. *Synthese.*
Guenthner, Franz, Jaap Hoepelman, & Christian Rohrer. 1978. 'A Note on the Passé Simple'. In C. Rohrer (ed), *Papers on Tense, Aspect and Verb Classification.* Tübingen: Gunter Narr.
Guiraud-Weber, Marguerite. 1987. 'Oppositions Aspectuelles et Sémantisme Verbal en Russe'. *Revue des Études Slaves* 59(3): 585-96.
Guiraud-Weber, Marguerite. 1988. 'Sémantisme Verbal et Aspect en Russe'. *Communications de la Délégation Française.* X Congrès International des Slavistes, Sofia, 14-22 Septembre 1988. Paris: Institut d'études slaves.
Hamburger, Käte. 1973. *The Logic of Literature.* (M. Rose, translation.) Bloomington, Indiana: Indiana University Press.
Hardy, Frank. 1979. *Navajo Aspectual Verb Stem Variation.* University of New Mexico Ph.D dissertation.
Harris, Martin. 1982. 'The 'Past Simple' and 'Present Perfect' in Romance'. In M. Harris & N. Vincent, (eds). *Studies in the Romance Verb.* London: Croom Helm.
Heim, Irene. 1982. *The Semantics of Definite and Indefinite Noun Phrases.* Ph.D dissertation, Graduate Linguistic Student Association, University of Massachusetts-Amherst.
Heim, Irene. 1983a. 'File Change Semantics and the Familiarity Theory of Definiteness'. In Bauerle, R., C. Scharze & A. Stechow (eds), *Meaning, Use and Interpretation of Language.* Berlin: de Gruyter.
Heim, Irene. 1983b. 'On the Projection Problem for Presuppositions'. In Barlow, M. et al (eds), *Proceedings of the 2nd Annual West Coast Conference on Formal Linguistics*, Stanford University, 114-125.
Heinämäki, Orvokki. 1973. *The Semantics of English Temporal Connectives.* Ph.D dissertation, University of Texas at Austin.

Heinämäki, Orvokki. 1983. 'Aspect in Finnish'. In C. deGroot & H. Tommalo (eds), *Aspect Bound.* Dordrecht: Foris.
Herweg, Michael. 1991a. 'Perfective and imperfective aspect and the theory of events and states'. *Linguistics, 29:* 969-1010.
Herweg, Michael. 1991b. 'A critical examination of two classical approaches to aspect'. *Journal of Semantics, 8:* 363-402.
Hirschberg, Julia & Janet Pierrehumbert. 1986. 'The Intonational Structuring of Discourse'. *24th Meeting of the Association for Computational Linguistics, Proceedings.*
Hoepelman, Jaap. 1978. 'A Note on the Treatment of the Russian Aspects in a Montague Grammar'. In C. Rohrer (ed), *Papers on Tense, Aspect and Verb Classification.* Tübingen: Gunter Narr.
Hoepelman, Jaap & Christian Rohrer. 1980. 'On the Mass-Count Distinction and the French Imparfait and Passé Simple'. In C. Rohrer (ed), *Time, Tense, and Quantifiers.* Tübingen: Niemeyer.
Holiskey, Dee Ann. 1981. 'Aspect Theory and Russian Aspect'. In Tedeschi & Zaenen.
Holquist, Michael. 1989. *The Gauss Seminars.* Princeton University, Princeton, New Jersey.
Hopper, Paul. 1979. Aspect and Foregrounding in Discourse. In T. Givon (ed), *Syntax and Semantics Vol 12: Discourse and Syntax.* New York: Academic Press.
Hopper, Paul & Sandra Thompson. 1980. 'Transitivity in Grammar and Discourse'. *Language* 56: 251-299.
Iljic, Robert. 1987. *L'Exploitation Aspectuelle de la Notion de Franchissement en Chinois Contemporain.* Paris: L'Harmattan.
Imbs, Paul. 1960. *L'Emploi des Temps Verbaux en Français Moderne.* Paris: Klincksieck.
Isačenko, Aleksandr V. 1960. *Grammaticeskij stroj russkogo jazyka v sopostavlenii s slovackim. Cast' 2-aja: Morfologija.* Bratislava: Izdatel'stvo slovackoj akademii nauk.
Isačenko, Aleksandr V. 1968. *Die russische Sprache der Gegenwart: Formenlehre.* Munich.
Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar.* Cambridge, Mass.: MIT Press.
Jacobsen, William. 1982. 'Vendler's Verb Classes and the Aspectual Character of Japanese *te iru*'. *Proceedings of the 8th Annual Meeting, Berkeley Linguistic Society.* Berkeley, California.
Jakobson, Roman. 1932. 'Zur Struktur des russischen Verbums'. In *Selected Writings of Roman Jakobson, vol. 2 (Word and Language):* 3-15. The Hague: Mouton, 1971.
Jakobson, Roman. 1957. 'Shifters, Verbal Categories, and the Russian Verb'. In L. R.Waugh & M Halle (eds), *Russian and Slavic Grammar: Studies 1931-1981.* Berlin: Mouton, 1984.
Jakobson, Roman. 1966. 'The Relationship between Russian Stem Suffixes and Verbal Aspects'. In *Selected Writings of Roman Jakobson, vol. 2.* The Hague: Mouton. 1971
Janda, Laura. 'The Meanings of Russian Verbal Prefixes: Semantics and Grammar'. In M. Flier & A. Timberlake (eds), *The Scope of Slavic Aspect. UCLA Slavic Studies Vol. 12.* Columbus, Ohio: Slavica Press.
Jespersen, Otto. 1931. *A Modern English Grammar on Historical Principles, Book IV, Syntax.* London: George Allen and Unwin.
Jia, Y. 1985. 'Guanyu Shiliang Buyu de Lingwai liang Zhong Geshi'. *Yuyuan Jiaoxue yu Yanjiu 1:* 23-29.
Johnson-Laird, Philip. 1983. *Mental Models: Towards a Cognitive Science of Language, Inference, and Consciousness.* Cambridge, Mass.: Harvard University Press.
Johnson-Laird, Philip. 1989. 'Mental Models'. In Posner, M. (ed), *Foundations of Cognitive Science.* Cambridge, Mass: MIT Press.
Johnson-Laird, Philip & Alan Garnham. 1980. 'Descriptions and Discourse Models'. *Linguistics and Philosophy* 3: 371-393.
Joos, Martin. 1964. *The English Verb: Form and Meaning.* Madison, Wisconsin: The University of Wisconsin Press.
Kamp, Hans. 1979. *Events, Instants, and Temporal Reference.* In Bauerle, R., U. Egli & A. Stechow (eds), Semantics from Different Points of View: 376-417. Berlin: de Gruyter.
Kamp, Hans. 1980. 'Some Remarks on the Logic of Change, Part I'. In C. Rohrer (ed), *Time, Tense and Quantifiers.* Tübingen: Max Niemeyer.
Kamp, Hans. 1981. 'A Theory of Truth and Semantic Interpretation'. In J. Groenendijk, T. Janssen & M. Stockhof (eds), *Formal Methods in the Study of Language.* Mathematisch Centrum Tracts, Amsterdam.

Kamp, Hans. 1985. 'Context, Thought and Communication'. *Proceedings of the Aristotelian Society 85*: 239-261.
Kamp, Hans & Christian Rohrer. 1983. 'Tense in Texts'. In Bauerle, R., C. Schwarze, & A. Stechow (eds), *Meaning, Use and Interprtation of Language*. Berlin & New York: de Gruyter.
Kamp, Hans & Christian Rohrer. 1989. *A Discourse Representation Theory Account of Tense in French*. ms.
Kamp, Hans, & Uwe Reyle. 1993. *From Discourse to Logic*. Dordrecht: Kluwer Academic Publishers.
Karcevski, Serge. 1927. *Système du Verbe Russe: Essai de Linguistique Synchronique*. Prague.
Kari, James. 1979. 'Athabaskan verb theme categories: Ahtna'. *Alaska Native Language Center Research Papers, No. 2*. Fairbanks, Alaska.
Kari, James. 1990. *Ahtna Athabaskan dictionary*. Alaska Native Language Center. Fairbanks, Alaska.
Karttunen, Lauri. 1971. 'Implicative verbs'. *Language. 47.2*: 340-358.
Kenney, Anthony. 1963. *Action, Emotion and Will*. London: Routledge and Kegan Paul.
Kim, C. 1982. 'Aspects of Aspect in Korean'. *Linguistic Journal of Korean* 7.2: 570-582.
Klein, Ewan. 1986. 'VP Ellipsis in DR Theory.' In Groenendijk, J. (ed), *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*. Dordrecht: Foris.
Klein, Wolfgang, 1992. 'The present perfect puzzle'. *Language*, 68: 525-552.
Klum, Arne. 1961. *Verbe et Adverbe*. Acta Universitatis Supsaliensis. Stockholm: Almquist & Wiksell.
Kratzer, Angelika. 1989. 'Stage-Level and Individual-Level Predicates'. In E. Bach, A. Kratzer & B. Partee (eds), *Papers on Quantification*, Department of Linguistics, University of Massachusetts at Amherst.
Krauss, Michael. 1969. 'On the classifiers in the Athapaskan, Eyak and Tlingit Verb'. *Indiana University Publications in Anthropology and Linguistics, Memoir 24 of IJAL Supplement to 35* (4): 53-83.
Krifka, Manfred. 1987. 'Nominal Reference and Temporal Constitution: Towards a Semantics of Quantity'. *FNS-Bericht 17*. Universitat Tubingen.
Krifka, Mandfred. 1989. 'Nominal reference, temporal constitution and quantification in event semantics', in R. Bartsch et. al. (eds.), *Semantics and Contextual Expressions*, Foris, Dordrecht.
Krifka, Manfred. 1992. 'Thematic relations as links between nominal reference and temporal constitution'. In I. Sag & A. Szabolcsi (eds), *Lexical Matters*. Chicago Univrsity Press, CSLI publications.
Kruisinga, Etsko. 1925. *A Handbook of Present-Day English*. Utrecht: Kemink en Zoon.
Kruisinga, Etsko and P. Erades. 1953. *An English Grammar (8th edition)*. Groningen: Noordhof.
Kuçera, Henry. 1981. 'Aspect, markedness, and t_o'. In P. Tedeschi & A. Zaenen (eds), *Tense and Aspect: Syntax and Semantics Volume 14*. New York: Academic Press.
Kuçera, Henry. 1983. 'A Semantic Model of Verbal Aspect'. In M. Flier (ed), *American Contributions to the 9th International Congress of Slavists*. Kiev, 1983. Vol. 1. Columbus, Ohio: Slavica Press.
Kuçera, Henry & Karla Trnka. 1975. 'Time in Language'. *Michigan Slavic Publications*. Ann Arbor: University of Michigan Press.
Kuczaj, Stan. 1979. 'Why do Children Fail to Overgeneralize the Progressive Inflection?' *Journal of Child Language 5:* 167-171.
Kuryłowicz, Jerzy. 1964. *The Inflectional Categroies of Indo-European*. Heidelberg: Carl Winter, Universitatsverlag.
Kuryłowicz, Jerzy. 1972. 'The Role of Deictic Elements in Linguistic Evolution'. *Semiotica* 2: 174-183.
Labov, William & Joshua Waletzky. 1967. 'Narrative Analysis: Oral Versions of Personal Experience'. In *Essays on the Verbal and Visual Arts: Proceedings of the 1966 annual meeting, American Ethnological Society*: 12-44. Seattle: University of Washington Press.
Lakoff, George. 1970. *Irregularity in Syntax*. New York: Holt, Rinehart Winston.
Lakoff, George. 1987. *Women, Fire, and Dangerous Things*. Chicago: University of Chicago Press.
Lamiroy, Beatrice. 1987. 'The Complementation of Aspectual Verbs in French'. *Language* 62.2: 278-298.
Lascarides, Alex, & Nicholas Asher. 1993. 'Temporal coherence and defeasible knowledge'. *Theoretical Linguistics*, 19: 1-37.
Lee, Gregory. 1971. 'Subjects and Agents II'. *Working Papers in Linguistics #7*, Department of Linguistics, The Ohio State University, Columbus, Ohio.
Leech, Geoffrey. 1970. *Towards a Semantic Description of English*. Bloomington: Indiana University Press.

Le Guern, M. 1986. 'Notes sur le Verbe Français'. In Remi-Giraud, S. & M. Le Guern (eds), *Sur le Verbe*. Lyons: Presses Universitaires de Lyon.
Lehmann, Volkmar. 1981. 'Aspektpartner und aspektuelle Verbgruppen im russischen'. *Slavistische linguistik 1980*: 74-94. München.
Lehmann, Volkmar. 1984. 'Russischer Aspekt und sowjetische Aspektforschung'. *Handbuch des Russisten*, ed. by Helmut Jachnow: 67-102. Wiesbaden: Otto Harrassowtiz.
Lehmann, Volkmar. 1988. 'Der russische Aspekt und die lexicalische Bedeutung des Verbs'. *Zeitschrift für slavisches Philologie, 48*: 170-81.
Leslie, Alan M. 1988. 'The necesity of illusion: Perception and thought in infancy'. In L. Weiskrantz (ed), *Thought without Language*, Oxford Science Publications.
Leslie, Alan M. 1994. 'ToMM, ToBy, and Agency: Core architecture and domain specificity'. In L. A. Hirschfield & S. A. Gelman (eds.), *Mapping the Mind: Domain specificity in cognition and culture*. Cambridge University Press.
Levin, Beth, & Malka Rappaport Hovav. 1995. *Unaccusativity: At the syntax-lexical semantics interface*. Cambridge, Mass: MIT Press.
Levinson, Stephen. 1983. *Pragmatics*. Cambridge, England: Cambridge University Press.
Levinson, Stephen. 1985. *Minimization and Conversational Inference*. Paper presented at the International Pragmatics Conference, Viareggio, Italy. Ms.
Lewis, David. 1972. General Semantics. In D. Davidson & G. Harmon (eds), *Semantics of Natural Language*. Reidel: Dordrecht.
Li, Charles, & Sandra Thompson. 1981. *Mandarin Chinese: Functional Reference Grammar*. Berkeley: University of California Press.
Li, Ying-che. 1974. 'What does "disposal" mean? Features of the Verb and Noun in Chinese'. *Journal of Chinese Linguistics* 2.1: 200-218.
Lindstedt, Jan. 1985. *On the Semantics of Tense and Aspect in Bulgarian*. Helsinki: Slavica Helsingrensia.
Lips, Marguerite. 1926. *Le Style Indirect Libre*. Paris: Payot.
Lu, John H-T. 1975. 'Resultative verb complements vs. directional verb complements in Mandarin'. *Journal of Chinese Linguistics* 5.2: 276-313.
Lyons, John. 1977. *Semantics, Volume 2*. Cambridge, England: Cambridge University Press.
Majewicz, A. 1985. *The Grammatical Category of Aspect in Japanese and Polish: A Comparative Perspective*. Poznan: Adam Mickiewicz University Press.
Marchand, Hans. 1955. 'On a Question of Aspect'. *Studia Linguistics 9*: 45-52.
Maslov, Jurij S. 1948. 'Vid i leksiceskoe znacenie glagola v sovremennom russkom literaturnom jazyke'. *Izvestija Akademii nauk SSSR, Otdel literatury ijazyka 7(4)*: 303-16.
Maslov, Jurij S. 1959. 'Glagol'nyj vid v sovremennom bolgarskom literaturnom jazyke (znacenie i upotreblenie)'. *Voprosy grammatiki bolgarskogo literaturnogo jazyka*, ed. by S. Bernstejn: 157-312. Moscow: Akademija nauk SSSR.
Maslov, Jurij S. 1965. 'Sistema osnovnyx ponjatij i terminov slavjanskoj aspektologii'. *Voprosy obscego jazykoznanija*, ed. by Ju. S. Maslov and A. V. Fedorov: 53-80. Leningrad: Izdatel'stvo Leningradskogo gosudarstvennogo universiteta.
Maslov, Ju. S. 1973. 'Universal'nye semanticeskie komponenty v soderzanii grammaticeskoj kategorii soversennogo/nesoversennogo vida'. *Sovetskoe slavjanovedenie 4*: 73-83.
Maslov, Jurij. 1948. 'Vid i leksiceskoe znacenie glagola v sovremennom russkom literaturnom jazyke'. *Izvestija Akademii nauk SSSR, Otdel literatury ijazyka 7 (4)*: 303-16.
McCawley, James, 1972. 'Tense and time reference in English'. In Fillmore, C., & D. T. Langendoen (eds), *Studies in Linguistic Semantics*. New York: Holt, Rinehart.
McCoard, Robert. 1976. *Tense Choice and Pragmatic Oppositions: A Study of Preteri/Perfect Oppositions in English*. Ph.D dissertation, University of California at Los Angeles.
Mehlig, Hans. 1981. 'Satzsemantik und Aspektsemantik im russischen (zur Verbalklassifikation von Zeno Vendler)'. *Slavistische Linguistik 1980*: 95-151. *Slavistische Beitrage 147*. Munich: Otto Sagner. Russian abridged translation in *Novoe v zarubeznoj lingvistike 15*: 227-49. Moscow: Progress Publishers.

Michaelis, Laura, 1994. 'The ambiguity of the English present perfect'. *Journal of Linguistics, 30*: 111-157.
Midgette, Sarah. 1987. *The Navajo Progressive in Discourse Context: A Study in Temporal Semantics*. Ph.D dissertation, University of New Mexico.
Midgette, Sarah. 1996. 'Lexical aspect in Navajo: The telic property'. In Jelinek, E., S. Midgette, K. Rice, & L. Saxon (eds), *Athabaskan Language Studies: Essays in honor of Robert W. Young*. Albuquerque, NM: University of New Mexico Press.
Millet, Yves. 1969. 'Répétition et aspect en Tchèque Contemporain'. *Revue des études slaves* 48: 49-57.
Mittwoch, Anita. 1980. 'The Grammar of Duration'. *Studies in Language, 4*: 201-227.
Mittwoch, Anita. 1988. 'Aspects of English Aspect: on the Interaction of Perfect, Progressive and Durational Phrases'. *Linguistics and Philosophy, 11*: 203-254.
Moens, Mark. 1987. *Tense, Aspect and Temporal Reference*. Ph.D Thesis, Centre for Cognitive Science, University of Edinburgh.
Molosnaja, T. N. 1973. 'O vidovoj parnosti glagolov v slavjanskix jazykax'. *Problemy grammaticeskogo modelirovanija*, ed. by A. A. Zaliznjak: 243-53. Moscow: Nauka.
Mourelatos, Alex. 1978. 'Events, Processses and States'. *Linguistics and Philosophy* 2: 415-434.
Mourelatos, A. 1993. 'Aristotle's kinêsis/energeia Distinction: A marginal note on Kathleen Gill's paper'. *Canadian Journal of Philosophy, 23*: 385-388.
Ogihara, Toshi. 1989. *Temporal Reference in English and Japanese*. Ph.D. dissertation, University of Texas at Austin.
Osherson, Daniel &Edward Smith. 1981. 'On the Adequacy of Prototype Theory as a Theory of Concepts'. *Cognition 9*: 35-58.
Palmer, Frank R. 1974. *The English Verb*. London: Longman.
Paris, Marie-Claude. 1981. *Problèmes de Syntax et de Semantique en Linguistique Chinoise*. Paris: Collège de France.
Paris, Marie-Claude. 1988. 'Durational Complements and Verb Copying in Chinese'. *Tsing Hua Journal of Chinese Studies New Series Vol 28.2*: 423-439
Parsons, Terence. 1989. 'The Progressive in English: Events, States and Processes'. *Linguistics and Philosophy*. 12: 213-241.
Parsons, Terence. 1990, *Events in the Semantics of English*. Cambridge, Mass: MIT Press.
Partee, Barbara. 1973. 'Some Structural Analogies between Tenses and Pronouns in English'. *The Journal of Philosophy* 70: 601-609.
Partee, Barbara. 1977. 'John is Easy to Please'. In A. Zampolli (ed), *Linguistic Structures in Processing*. Amsterdam: North-Holland.
Partee, Barbara. 1984. 'Nominal and temporal anaphora'. *Linguistics & Philosophy, 7*: 243-286.
Pelletier, Francis J. (ed). 1979. *Mass Terms: Some Philosophical Problems*. Dordrecht, Holland: Reidel.
Pelletier, Francis J., & Lenhart Schubert. 'Mass Terms.' In *Technical Report TR 87-3*, Department of Computing Science, The University of Alberta, Edmonton, Canada.
Pickbourn, J. *A Dissertation on the English Verb: Principally Intended to Ascertain the Meaning of the Tenses*. Reissued: Menston, Englan: Scholar Press.
Poutsma, Hendrik. 1928. *A Grammar of Late Modern English, Volume II*. Groningen: Noordhof.
Prior, Arthur N. 1967. *Past, Present, and Future*. Oxford:Oxford University Press.
Putnam, Hilary. 1975. *Mind, Language and Reality: Philosophical Papers, Volume 2*. Cambridge University Press.
Quine, Willard V. O. 1960. *Word and Object*. Cambridge, Mass: Technology Press, MIT.
Rappaport, Gilbert. 1980. *Invariance and the Grammatical Categories of the Russian Verb*. Unpublished paper.
Rappaport, Gilbert C. 1984b. 'Grammatical function and syntactic structure: The adverbial participle of Russian'. *UCLA Slavic studies 8*. Columbus, OH: Slavica Publishers, Inc.
Rassudova, Olga P. 1982. *Upotreblenie vidov glagola v sovremennom russkom jazyke*. 2d ed. Moscow: Russkij jazyk.
Rassudova, Olga P. 1977. 'Aspectual Meaning and Aspectual Context in the Teaching of the Russian Verbal Aspects'. R. Brecht & D. Davidson (eds), *Soviet-American Russian Language Contributions*. Urbana, Illinois: University of Illinois.
Reichenbach, Hans. 1947. *Elements of Symbolic Logic*. London: Macmillan

Remi-Giraud, Sylvianne, & M. Le Guern. 1986. *Sur la Verbe*. Lyon: Presses Universitaires de Lyon.
Reyle, Uwe. 1985. 'Grammatical Functions, Discourse Referents and Quantification'. In *International Joint Conference on Artificial Intelligence 8*, Los Angeles.
Roberts, Craige. 1986. *Modal Subordination, Anaphora, and Distributivity*. Ph.D dissertation, University of Massachusetts.
Roeper, Thomas & Edwin Williams (eds). 1987. *Parameter Setting*. Dordrecht: Reidel.
Rogers, Andy. 1971. 'Three Kinds of Physical Perception Words'. *Proceedings of the Chicago Linguistic Society*. Chicago: University of Chicago Linguistics Department.
Rohrer, Christian. 1985. 'Indirect Discourse and 'Consecutio Temporum'. In V. Lo Cascio & C. Vet (eds), *Temporal Structure in Sentence and Discourse*. Dordrecht, Holland: Foris.
Rohsenow, John. 1978. *Syntax and Semantics of the Perfect in Mandarin Chinese*. Ph.D dissertation, University of Michigan.
Rooth, Mats. 1986. 'Noun Phrase Interpretation in Montague Grammar, File Change Semantics, and Situation Semantics'. *Report #CSLI-86-15*, CSLI, Stanford University.
Rosch, Eleanor. 1973. 'Natural Categories'. *Cognitive Psychology 4*: 328-50.
Rosch, Eleanor. 1978. 'Principles of Categorization'. In E. Rosch & B. Lloyd (eds), *Categorization and Cognition*. Hillsdale, NJ: Erlbaum.
Rosch, Eleanor, Carolyn Mervis, Wayne Carey, David Johnson, Penny Boyes-Braem. 1976. 'Basic Objects in Natural Categories'. *Cognitive Psychology 8*: 382-439.
Ross, John. 1972. 'Act'. In D. Davidson & G. Harmon (eds), *Semantics of Natural Languages*. Reidel: Dordrecht.
Ryle, Gilbert. 1947. *The Concept of Mind*. London: Barnes & Noble.
Sapir, Edward. 1921. *Language*. New York: Harcourt, Brace & Company.
Sapir, Edward & Harry Hoijer. 1967. 'The phonology and morphology of the Navajo language'. *University of California Publications in Linguistics* (Vol 50). Berkeley, University of California Press.
Selkirk, Lisa. 1981. 'The Syntax of Words'. *LI Monograph Series 7*. Cambridge, Mass: MIT Press.
Sells, Peter. 1987. 'Aspects of Logophoricity'. *Linguistic Inquiry 18*: 445-479.
Simpson, Jane. ed. *Resultatives*. Unpublished paper.
Singh, Mona. 1991. 'The Perfect paradox'. *Proceedings of the Berkeley Linguistic Society*. Berkeley, California: Department of Linguistics, University of California.
Smith, Carlota S. 1996. Aspectual Categories in Navajo. *International Journal of American Linguistics, 62*: 227-263.
Smith, Carlota S. 1978. 'The Syntax and Interpretation of Temporal Expressions in English'. *Linguistics & Philosophy* 2: 43-100.
Smith, Carlota S. 1980. 'Temporal Structures in Discourse'. In N. Rohrer (ed), *Time, Tense and Quantifiers*. Tübingen, Germany: Niemeyer.
Smith, Carlota. 1983. 'A Theory of Aspectual Choice'. *Language, 59*: 479-501.
Smith, Carlota S. 1983. 'The Temporal Reference of the English Futurate'. *Communication and Cognition*. 16: 81-96.
Smith, Carlota S. 1981. 'Comments: On the Deductive Model and the Acquisition of Productive Morphology'. In C.L. Baker & J. McCarthy, (eds.), *The Logical Problem of Language Acquisition*. Cambridge, Mass: MIT Press.
Smith, Carlota S. 1986. 'A Speaker-Based View of Aspect'. *Linguistics and Philosophy 9*: 97-115.
Smith, Carlota S. 1990. 'Event Types in Mandarin'. *Linguistics, 28*: 309-336.
Smith, Carlota S. 1993/5. 'The range of aspectual situation types'. In P. M. Bertinetto et. al. (eds.), *Temporal Reference: Aspect and Actionality*. Vol. 2. Rosenberg & Sellier, Turin.
Smith, Carlota S. 1994. 'Aspectual viewpoint and situation type in Mandarin Chinese'. *Journal of East Asian Linguistics, 3*: 107-146.
Smith, Carlota S. 1996. *Activity sentences and dynamism*. Submitted for publication.
Smith, Carlota S. in preparation. *The dynamics of narrative*.
Smith, Carlota S. & Richard Weist. 1987. 'On the Temporal Contour of Child Language: A reply to Rispoli and Boom'. *Journal of Child Language* 14: 387-92.
Smith, Neil (ed). 1982. *Mutual Knowledge*. London: Academic Press.

Sørensen, H. 1964. 'On the semantic unity of the perfect tense'. In *English Studies* presented to R.W. Zandvoort on his 70th birthday. Amsterdam: Swets and Zeitlinger.
Spanos, George. 1979. 'Contemporary Chinese Use of Le: a Survey and a Pragmatic Proposal'. *Journal of the Chinese Language Teachers Association.* 14.1: 36-70; 14.2: 47-102.
Speas, Margaret J. 1986. *Adjunctions and Predictions in Syntax.* Ph.D dissertation, Massachusetts Institute of Technology.
Stalnaker, Robert. 1972. 'Pragmatics'. In D. Davidson & G. Harmon (eds). *Semantics of Natural Language*. Dordrecht: Reidel.
Steedman, Mark. 1981. 'The nature of temporal reference explains the variety of tenses, aspects, and time adverbials'. Paper presented at the Sloan Workshop, Ohio State University.
Steele, Susan, et al. 1981. *An Encyclopedia of AUX: A study of Cross Linguistic Equivalence.* Cambridge, Mass: MIT Press.
Sten, Holger. 1952. *Les Temps du Verb Fini (indicatif) en Français Moderne*. Copenhagen: Munksgaard.
Svedova, N. et al. 1980. *Russkaja grammatika, vol. 1. Fonetika. Fonologia. Udarenie. Intonacija. Slovoobrazovanie. Morfologija.* Moscow.
Svedova, L. N. 1984. *Trudnye slucai funkcionirovanija vidov russkogo glagola (k probleme konkurencii vidov).* Moscow: Izdatel'stvo moskovskogo universiteta.
Talmy, Leonard. 1985. 'Lexicalization Patterns: Semantic Structure in Lexical Forms'. In T. Shopen (ed.), *Language Typology and Syntactic Description, Vol. 3*. Cambridge, England: Cambridge University Press.
Tasmowski-De Ryck, Liliane. 1985. 'L'imparfait avec et sans rupture'. *Langue Française* 67: 59-77.
Taylor, Barry. 1977. 'Tense and Continuity'. *Linguistics & Philosophy, 1*: 199-220.
Tedeschi, P. & A. Zaenen (eds). *Syntax and Semantics:Tense and Aspect.* New York: Academic Press.
Teng, Shou-hsin. 1975. *A semantic study of transitivity relations in Chinese.* Ph.d dissertation. University of California at Berkeley.
Teng, Shou-hsin. 1973. 'Negation and Aspects in Chinese'. *Journal of Chinese Linguistics, 1*: 14-37.
Teng, Shou-hsin. 1979. 'Progressive aspect in Chinese'. *Computational analyses of Asian and African languages, No. 11.*
Timberlake, Alan. 1982. 'Invariance and the syntax of Russian aspect'. In P. Hopper (ed), *Tense-Aspect: Between semantics and pragmatics*: 305-31. Amsterdam: John Benjamins.
Timberlake, Alan. 1984a. 'Reichenbach and Russian aspect'. In Flier & Timberlake: 153-68.
Timberlake, Alan. 1984b. 'The temporal schemata of Russian predicates'. In Flier & Brecht: 35-57.
Trubetzkoy, Nikolai S. 1939. *Grundzüge der Phonologie.* Prague: Cercle Linguistique de Prague.
Twaddell, W. Freeman. 1965. *The English Verb Auxiliaries.* Providence: Brown University Press.
Vaček, Jan.1964. *A Prague School Reader in Linguistics.* Bloomington, Indiana: Indiana University Press.
van Benthem, Jeremy. 1980. 'Points and Periods'. In C. Rohrer (ed), *Time, Tense and Quantifiers.* Tübingen: Max Niemeyer.
Vendler, Zeno. 1957. 'Verbs and Times'. Philosophical Review. In 1967, *Linguistics in Philosophy.* Ithaca: Cornell University Press.
Verkuyl, Henk. 1972. 'On the Compositional Nature of the Aspects'. *Foundations of Language Supplementary Series, Volume 15.* Reidel: Dordrect, Holland.
Vet, Co. 1980. *Temps, Aspects et Adverbs de Temps en Français Contemporain.* Genève: Librarie Droz.
Vet, Co. 1985. 'Univers de Discours et Univers d'Enonciation: Le Temps du Passé et du Future'. *Langue Française.* 1985: 38-58.
Viberg, Ake. 1983. 'A universalization hierarchy for the verbs of perception'. In F. Karlsson (ed), *Papers from the 7th Scandinavian Conference of Linguistics.* Department of General Linguistics, University of Helsinki.
Vikner, Carl. 1985. 'L'aspect comme modificateur du mode d'action: à propos de la construction etre + participe passe'. *Langue Française, 1985, 67*: 95-113.
Vlach, Frank. 1981. 'The Semantics of the Progressive'. P. Tedeschi & A. Zaenen (eds), *Tense and Aspect: Syntax and Semantics 14.* New York: Academic Press.
von Wright, Georg H. 1963. *Norm and Action.* New York: Humanities Press.
Waugh, Linda & Monique Monville-Burston. 1986. 'Aspect and Discourse Function: the French simple past in newspaper usage'. *Language: 62*: 846-877.

Webber, Bonnie. 1981. 'Discourse model synthesis: Preliminaries to Reference'. In A. K. Joshi, B.L. Webber, & I.A. Sag (eds), *Elements of Discourse Understanding.* Cambridge: Cambridge University Press.
Weinrich, Harald. 1973. *Le Temps.* Paris: Éditions du Seuil.
Westfall, Ruth. 1995. *Simple and Progressive Forms of the Spanish Tense System: A Semantic and Pragmatic Study in Viewpoint Contrast.* Ph.D dissertation, University of Texas.
Whitaker, Jeanne & Carlota S. Smith. 1985. 'Some Significant Omissions: Ellipsis in Flaubert's *Un Coeur Simple*'. *Language and Style 14:* 25-92.
White, James. 1761. *The English verb: a grammatical essay.* Reissued by Scholar Press, Ltd., Menston, England, 1969.
Whorf, Benjamin Lee. 1956. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf.* New York: Wiley.
Wittgenstein, Ludwig. 1953. *Philosophical Investigations.* Oxford: Blackwell.
Yeh, Meng. 1993. 'The Stative Situation and the Imperfective Zhe in Mandarin'. *Journal Chinese Language Teachers Association, 28*: 69-98.
Yeh, Meng, 1996. 'An analysis of the Experiential GUO in Mandarin: A temporal quantifier'. *Journal of East Asian Linguistics, 5*: 151-182.
Young, Robert & William Morgan. 1987. *The Navajo Language*. Albuquerque, New Mexico: University of New Mexico Press.
Young, Robert & William Morgan. 1988. *Inception in the Navajo Verb.* Unpublished paper.
Young, Robert, Jim Morgan, & Sarah Midgette. 1992. *Analytical Lexicon of the Navajo Language*. Albuquerque, New Mexico: University of New Mexico Press.
Zandvoort, Reinhard. 1960. *A Handbook of English Grammar.* London: Longman, Green.

Subject Index

Accomplishment, 21, 6-8, 45-6, 125-6, 128, 135-6, 150 ff, 178-80, 218, 245, 287, 291
Achievement, 21, 30-32, 46-7, 125-6, 129, 136, 161, 181-2, 220, 247, 291
Activity, 21, 23-5, 44-5, 125-6, 128, 133-5, 177-8, 215, 243, 285
Acquisition, xv
Adverbials, 40 ff., 99, 112 ff., 132, 199, 210, 214, 251 ff, 263, 265,
  completive, 43, 59, 114
  direct durative, 41, 59, 113, 188, 306, 312, 325
  indirect durative, 312, 314, 315, 325-6
  frequency, 116
  locating, 99, 109, 113, 119, 189
  momentary, 42, 72
Adversative, 306-7, 317
Affected object, 27, 31, 269, 291
Agent, Agency, 21, 31, 37, 40, 176, 182, 214, 223
Aktionsart, 1, 242
Annulled Result convention, 238
Array , 309, 311, 314, 315-7
Aspectual choice, 6 ff., 18, 51 ff., 144-5, 286
  marked, 11, 51, 75, 84, 89, 92-3, 135, 163, 174-5, 272
Aspectual clash, 52-4, 114, 115
Augmentation inference, 68, 86 ff., 105, 154, 158 ff., 278, 236 ff.
ba construction, 27, 288, 291
Backgrounding, 89-90, 91-2, 176, 206, 237-8, 307, 317
Bounds, boundedness, 23-4, 27, 35, 69, 73, 113, 244, 293
Bounds, implicit, 25, 35, 67, 139
byvalo, 249
Categorization, 10 ff., 18
Causal chain, 21 ff., 58
Cessative (see Egressive)
Characterizing convention, 89, 213
Clash of features, 53, 115, 149
Closed informationally, 65-7, 69-70, 78, 86, 88, 107, 170, 187, 194, 201ff, 212, 234ff., 266, 301, 318
Closed system, 4, 5, 8 ff.
Cognitive abilities, xv
Completion, 39, 43, 67-9, 114-5, 214, 243, 265, 284
Compositional rules, 54, 131 ff.
Conative, 76, 247
Conceptual meaning, 124, 141-2, 144-5, 153
Context , 51, 86, 142-3, 154, 158, 204
Continuing Result convention, 91, 236
Convention, 10, 88 ff., 157, 279 ff., 306 ff., 316
Countable, 20, 55, 133, 218, 309
Covert category, 39 ff., 131, 182, 312
Cumulative, 20, 23, 36, 55
Degree predicates, 24
Deixis, 98, 99, 103-4, 143, 183, 206-7
Delimitative prefixes, 69, 230, 244
Derived category, 17, 22, 50, 55, 195
Discontinuity convention, 238
Discourse Representation Structure, 87, 123, 144 ff.,154 ff.
Dominant viewpoint, 66, 86, 175, 212,

Duration, 19, 32, 41-2, 98, 113, 214, 243, 284, 302, 306, 312, 314
Durative events, Navajo, 297, 310, 313 ff.
Dynamism, 19, 22, 36, 40-1
Dynamic interpretation, 124, 142
Dynamic syntax, 39-41, 51, 76, 214, 243, 284, 286, 312
Egressive, 22, 49, 320-1
Entities, in DR theory, 123-4, 134, 142 ff., 145, 146, 148
Equipollent contrast, 9
Event, 19, 35-36, 104, 298
Experiential, 71, 82, 108, 266 ff.
Explicit bound, 24, 27
External override principle, 53, 55-6, 113, 114-5, 180
Final Emphasis convention, 90, 235
Futur, 78, 80, 202, 210 ff.
Futurate, 172, 189, 201, 203, 211
Generic, 33, 222, 241, 294
Grammaticality, 11
Grammaticized, 6, 14, 17, 144, 275, 297
Habituals, 33-5, 41, 50-1, 136-7, 183, 198-9, 208, 249, 294, 317
Homogeneity, 23, 52
Imparfait, 73 ff., 89, 197 ff., 204-6, 212
Imperfective paradox, 83
Imperfective viewpoints, 73 ff., 84 ff., 88ff., 126-7, 130, 150, 171, 231, 252, 273 ff., 301-4
  marked, 75 f.
Inceptive, 22, 25, 29, 42, 49, 78, 195, 254, 289, 319
Inchoative, 22, 34, 49, 70, 195-6, 265
Incompleteness convention, 89, 238
Independence of components, 61, 77, 81 ff., 127, 146, 269
Indeterminacy, 49, 81, 155 ff., 183, 188, 195, 215
Individual-level predicate, 33, 273, 293
Inference, 63, 86 ff., 152 ff., 157-8
Infinitives, Russian, 252 ff.
Instantaneous, 29, 41-2, 156, 172, 297, 317
Ingressive, 42, 114-5, 181
Intensional properties, 124, 146, 150, 153, 156
Intention convention, 236
Interaction, components, 126 ff., 174
Interpreted shifts, 52-3, 154 ff.
Invariant meaning, 13, 62, 86, 213, 228
Irrealis, 90
Lexical span, 21
LVM sentences, 78, 151, 277, 280, 304, 324
Markedness, 8 ff., 86
Marked focus, 51-2, 59
Mereological, 20, 35
Morphology, Russian, 228
Multiple-event Activities, 30, 50, 115, 198, 215, 272
Narrative, 66, 91 ff., 105, 176, 214, 236
Negation, Russian, 256
Neutral viewpoints, 77 ff., 127-8, 151, 162, 201ff., 277ff., 280, 300, 304, 323
Non-detachability, 26, 43, 46, 177, 214, 243, 285
Ongoing Event convention, 88
Open informationally, 63, 66, 73, 78, 84 ff., 170-1, 188, 195,, 197, 201, 234 ff., 271, 277, 318
Orientation features, 118-9
Paired verb forms, 229
Parameter, 2, 13-14, 61
Participant property, 107-9
Particles, Mandarin, 266, 272, 279, 296
Passé Composé, 69, 162, 194, 204-8, 213-4
Passé Simple, 154, 194, 204-8, 213-4
Path-goal, 27
Perception verbs, 56-7, 111
Perfect construction, 100, 102, 106 ff., 186 ff., 209, 266, 269
Perfective viewpoints, 66-9, 90 ff., 126, 127-9, 146-7, 170, 230-1, 252, 263, 279, 301
  and statives, 69 ff.
  marked, 71 ff.
  conceptual properties, 77
Performative, 111, 185
Personal property predicates, 57-8
Posture and location verbs, 33, 173, 273, 295
Pragmatic conventions, 8, 61, 86, 115, 154 ff., 175 ff., 235 ff., 279, 323
Pragmatic emphasis, 14, 88 ff., 90, 175, 234 ff.
Prague School, 8, 86
Preliminary stages, 30-31, 42, 71, 75, 82, 163, 172, 191, 197, 203, 233, 278, 302, 303, 305
Présent, 201 ff.
Present tense sentences, 34, 41, 110 et seq, 183, 185 ff., 201, 208, 251
Procedural force, 145

Progressive, 74, 89, 130, 150, 171-3, 175, 200, 271ff., 302, 304
  and statives, 84 ff.
Progressive stative, 11, 174
Prototype theory, 11, 12, 14
Punctual, 6, 42, 72, 204
Quantized, 20, 34, 55, 133
Reference Time, 100, 101, 102, 104, 107, 117 ff., 137 ff. 148-9, 204, 266
Relational features, values, 106, 117-9, 137 ff., 186
Result construction, 27, 179, 283
Resultative, 22, 33, 76, 82, 131, 163, 173-5, 273-4
Resultative Verb Complements, 69, 265-6, 270, 279, 282 ff., 288, 289, 292, 294
Role features, 118-9, 120
Scopal structure, 105, 116, 131, 132
Semelfactives, 29-30, 46, 75, 125-6, 129, 180, 220, 233, 246, 290
Sequentiality convention, 236, 279
Situation Time, 101, 127, 137, 148-9, 187, 266
Situation type, derived, 18, 22, 24, 32, 48 ff., 52, 55, 58, 70, 135-7
Situation type shifts, 18, 114-5, 152, 194, 286, 289
Speaker-based, 6
Specificity, 4, 230-1, 241, 245, 269, 281, 309
Speech Time, 98, 101, 110, 137, 148, 153, 190
Stage-level predicate, 33, 58, 70, 273, 293-4
Stage property, 19, 36, 77, 174-5, 272
Statement of Fact convention, 9, 89, 158, 239 ff., 254
Static property, 19, 22, 32
State, Stative, 19, 32-6, 47, 69 ff, 75, 84 ff., 125-6, 129, 136, 161, 170, 182, 220, 248, 258, 276, 292, 304, 317
Sub-interval property, 32, 36, 84
Subordinative contrast, 9
Super-lexical morphemes, 24, 25, 28, 48-49, 56, 242, 254, 293-4.
Symmetrical contrast, 9
Telicity, 3, 19, 20, 43-4, 50, 70, 125, 267, 313-4
Temporal clauses, 62, 64-5, 74, 79, 198, 201, 231, 277, 305
Temporal location rules, 119, 137-9, 148-150, 308
Temporal perspective, 99, 101, 103-4, 204, 206 ff.
Tense, 98, 106, 148, 204, 250, 323
Tentative reduplication, 271
Termination, 23, 42, 43, 45, 63, 67-8, 73, 264, 270, 271, 313
Tests, for aspectual information, 44 ff., 63 ff., 67-8, 73 ff., 194, 197, 231 ff., 256, 312
Truth conditions, 7-8, 52, 83, 97, 143-4, 152-3
Universal grammar, 2, 13-14, 61, 69, 203
Vague verb constellations, 58-0
Verbs, intrinsic value, 54
Verb constellation, 17, 18, 54 ff.
Verb incorporation, 25, 287
Verb lexeme category (VLC), 299, 308, 313, 315, 321 ff.
Visibility, 62 ff., 83, 98, 123, 147, 157, 257

Name Index

Abusch, D., 24
Ahn, xvi
Aksu, A., xv
Antinucci, F. & R. Miller, xv
Aristotle, 17
Asher, N., 160, 164
Austin, J., 111
Axelrod, M., 329
Bach, E., 20, 98
Baker, C. L., 120
Bakhtin, M., 214
Banfield, A., 104, 206
Bauer, G., 120
Bennett, M. & B. Partee, 98, 120, 164
Benveniste, E., 15, 120, 143, 213, 225
Boertien, H., 75
Boguslawski, A., 260
Boons, J. P., 217
Borillo, A., 216
Bransford J. et al, 164
Brecht, R., xvi, 59, 93, 94
Brown, R., xv, 10-11
Bull, W., 24, 120
Carrier-Duncan, J. & J. Randall 180
Carlson, 33
Carlson, G., & J. Pelletier, 33
Cartier, A., 283
Chan, M, 266, 276
Chang, V., 279
Chao,.Y. R, 267, 268, 269, 270, 271, 283, 286, 287, 296
Chomsky, N., 1, 15, 94, 108
Chen, G. T., 276
Cheung, H., 296
Chvany, C., 9, 15, 242
Clark, H., 99, 164
Cochrane, N., xvi, 37
Comrie, B., 15, 19, 73, 98, 120
Covington, A. & N. Schmitz, 164
Craik, K., 164
Croft, W., 21, 22
Curme, G., 172, 192
Dahl, O., 13, 14, 15, 74, 98, 120, 173
Davidson, D., 21
Descles, J. P., 204
Dowty, D., 19, 24, 26, 37, 58, 83, 84, 94, 98, 192
Dowty, D., R. Wall, & S. Peters, 143, 164
Du, J. W. H., 76
Ducrot, O., 89, 212
Dupont, N., 212
Eckert, E., 260
Fillmore, C., 98, 99, 143
Fleischman, S., 90, 209, 211
Flier, M., 69, 244
Foley. W. & R. van Valin, xvi, 37
Forsyth, J., 48, 91, 94, 235, 247, 254, 260
Fortescue, M., 81
Freed, A., 48, 49
Frey, W., 164
Friedrich, P., 14, 94
Garey, H., xvi, 19, 37, 205, 216, 218, 225
Garnham, A., 164
Gelman, R., 37
Givon, T., xvi, 14

Graham, D., 37
Green, G., 111
Greenberg, J., 9
Grévisse, M., 204, 225
Grice, H. P., 10, 52, 62, 265
Grimshaw, J. & A. Mester, 25
Gruber, J., 22, 27
Guenther, F., 164, 225
Guiraud-Weber, M., 257, 260
Hamburger, K., 213, 225
Hardy, F., xvi, 329
Harris, M., 209
Heim, I., 164
Heinämäki, O., xvi, 64, 81
Herweg, M., 35, 36, 37
Hirschberg, J. & J. Pierrehumbert, 329
Hoepelman, J., 94, 225
Hoepelman, J. & C. Rohrer, xvi
Holiskey, D., xvi
Holquist, M., 214
Hopper, P., 91
Hopper, P. & S. Thompson, 22, 92
Iljic, R., 108, 120, 268, 269
Imbs, P., 204, 213, 221, 225
Isačenko, A., 260
Jackendoff, R., 27
Jacobsen, W., xvi, 76, 296
Jakobson, R., 8, 9, 15, 61, 143, 227, 260
Jespersen, O., 15, 89-90, 108, 120, 172, 192
Johnson, M., xvi
Johnson-Laird, P., 164
Johnson-Laird, P & A. Garnham, 142
Joos, M., 192
Kamp, H., 94, 98, 141, 164
Kamp, H. & C. Rohrer, 6, 14, 36, 66, 101, 105, 110, 120, 150, 164, 203, 206, 211, 225
Kamp, H. & U. Reyle, 14, 120, 139, 164
Karcevski, S., 260
Kari, J., 317, 321, 329
Karttunen, L., 253
Kenny, A., 37
Kim, C., xvi
Klein, E., 164, 186, 189
Klum, A., 225
Kratzer, A., 33
Krauss, M., 329
Krifka, M., 20, 59, 139
Kruisinga, E., 174, 192
Kuczaj, S., xv
Kurylowicz, J., 99, 120
Lakoff, G., 12, 58
Lamiroy, B., 222
Lee, G., 12, 58
Leech, G., 15, 172
LeGuern, M., 212
Lehmann, V., 260
Leslie, A., 37
Levin, B. & M. Rappaport-Hovav, 180
Levinson, S., 94
Lewis, D., 141
Li, Y.-C., 296
Li, C. & S. Thompson, xvi, 266, 272, 276, 283, 286, 287, 293, 296
Lindstedt, J., xvi
Lips, M., 225
Lu, J., 283
Lyons, J., 6, 15, 72, 94, 120
Marchand, H., 174
Maslov, J., 259, 260
McCawley, J., 186, 192
McCoard, R., 107, 108, 120, 186, 188
Michaelis, L., 186, 192
Midgette, S., xvi, 92, 302, 308, 315, 324, 325, 329
Mittwoch, A., 37, 189
Mehlig, R., 260
Moens, M., 59
Molosnaja, T., 260
Mourelatos, A., 19, 20, 37, 57
Ogihara, T., 76, 120, 296
Osherson, D. & E. Smith, 12
Paris, M., 274, 275, 276, 283, 285, 296
Parsons, T., 37, 94
Partee, B., 37, 90
Pelletier, J. & F. Schubert, 133
Pickbourn, J., 120
Posner, R., 164
Poutsma, H., 174, 192
Prior, A., 120
Putnam, H., 12
Quine, W., 20
Rassudova, O., 236, 239, 240, 254, 255, 256, 257
Reichenbach, H., 101, 120, 187
Reyle, U., 164
Roberts, C., 164
Roeper T., & E. Williams, 13
Rogers, A., 57
Rohrer, C., xvi, 204
Rohsenow, J., 265
Rooth, M., 164
Rosch, E., 11 et seq
Ross, J., 40
Ryle, G., 27, 31, 37, 192
Sapir, E., 5
Sapir, E. & H. Hoijer, 329

Schauber, E., 327
Selkirk, L., 179
Sells, P., 164
Singh, M., 69
Smith, N., 88
Smith, C. S., xvi, 35, 37, 75, 104, 120, 139, 150, 172, 191, 192, 207, 287, 288, 296, 329
Smith, C. S. & R.Weist, 296
Smith, N., 88
Sørenson, H., 120
Spanos, G., 279
Speas, M., 329
Stalnaker, R., 143
Steedman, M., 65, 75
Steele, S., et al, 5
Sten, H., 203, 225
Stenning, K., 164
Svedova, N., 240
Talmy, L., xvi, 22, 49, 76
Tasmowski-de-Ryck, L., 213
Taylor, B., 19, 23, 37, 85, 94, 99, 192
Teng, S.-H., 276, 294, 296
Timberlake, A., xvi, 94
Trubetzkoy, N., 8
T'ung & Pollard, 280, 296
Twaddell, W.F., 192
van Bentham, J., 164
Vaček, A., 8
Vendler, Z., 3xvi, 7, 17, 23, 56, 192
Verkuyl, H., 4
Vet, C., 204, 208, 225
Viberg, 56
Vikner, A., 224
Vlach, F., 26, 85, 94, 192
von Wright, 43
Waugh, L. & M. Monville-Burston, 92, 213
Webber, B., 164
Weinrich, H., 92, 213
Weist, R., et al, xvi
Westfall, R., xvi, 90
Whitaker, J., & C.C. Smith, 92
White, 120
Whorf, R., 5
Wittgenstein, L., 12
Yeh, M., 71, 267, 268, 274, 296
Young, R. & W. Morgan, 299, 319, 320, 321, 323, 329
Young, R., W. Morgan, & S. Midgette, 329
Zandvoort, R., 224